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THE
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SATURDAY, JULY 5, 1919.

THE DUTY OF TRAMWAY AUTHORITIES.

WHEN the national agreement between tramway owners and employees was signed, on March 20, it was thought by many people that a basis for peaceful arrangement between the interests of labour and capital in tramway undertakings had been established. No one imagined that it was a final settlement, but the provisions of the agreement certainly contained the means for rational adjustment of the rival claims of the three parties concerned, viz., the workers, the community, and the capitalists. Tramway owners, both municipal and company, have honestly endeavoured to shoulder the burdens thus imposed, though they have proved unexpectedly heavy. The increased cost of labour incurred through the agreement has been far greater than anyone could reasonably have anticipated. Small undertakings and great are faced with wages bills enormously inflated. To London County Council the added toll is over £360,000 per annum, and little municipal undertakings struggling to make ends meet are compelled to seek rate aid to satisfy the demands of employees ratified by the agreement. Tramway authorities, however, have no magical powers of wealth production ; they are simply administrators of a public utility the cost of which must be defrayed by the people whom it serves. Municipal officials, tramway committees, tramway company officials and directors, are merely trustees of a certain amount of public money and a form of public service. They can only pass on to the patrons of the tramways the costs involved in the operation of the system. But the members of the community, to whose backs the added burden is transferred, are entitled to ask whether those in charge of tramway undertakings have been faithful to the interests entrusted to them. It is easy to be generous with other people's money. It is high time the owners of tramways took a more serious view of their obligations to their shareholders, ratepayers, and travelling public. Labour is not the only interest in the nation worthy of consideration. If they were unfairly treated in the past, that is no reason why the tramway workers should now act unjustly towards the community of which they form only a very small part. Already the cost of tramway service is higher than its economic value. To say so is to accuse the owners and administrators of tramway undertakings of having been unfaithful trustees, but the excuses which can be offered for their policy amount to ample justification. In most cases the alternatives have been ruin of a great enterprise, dislocation of public service, and probable social disorder, and conceding the claims put forward on behalf of the workers. To blame them for having chosen the latter alternative would be ungrateful, for "there was a war on," but under peace conditions a stronger stand in the public interest should be expected. Rumours which have an unusually strong foundation in fact are spreading abroad the notion that the tramway workers are formulating fresh demands, entailing further expense to the undertakings and the community. Concession after concession has imbued the younger and more active spirits among the workers with the idea that they can hold the community up to ransom. The nation is entitled to look to the tramway authorities for the dissipation of that mischievous and dangerous idea. The swelling bubble must be pricked and deflated before it grows so big that its explosion will spread havoc throughout the whole social fabric of the nation.

LONDON TRAFFIC INQUIRY.

The Select Committee of the House of Commons sat again on Tuesday at the House of Commons, and heard further evidence on behalf of the Underground group of companies. Mr. H. E. Blain, operating manager of the Underground and associated companies, continuing his evidence, said that the consumption of petrol by the motor lorr ibuses was nearly double that of the omnibuses, and they were losing from 6d. to 7d. per mile. With regard to omnibus q ieues, he was convinced that when once the queues were established, the people themselves would control them, as they did theatre queues. He put forward the following suggestions :—

(1) New powers to the police for the regulating of routes of, and control of, slow-going and stationary traffic ; (2) increased powers with regard to the fitness of traffic of vehicles at present unlicensed, and powers to license their drivers ; (3) simplification of the present procedure—with any Parliamentary sanction necessary—with regard to queues, fixed stopping places for omnibuses, and the regulation of traffic points ; (4) a raising of the authorised speed per hour of motor-omnibuses to 16 miles ; (5) a concentration of the control of everything affecting traffic in the area, whether it be licensing, routes, regulations, co-ordinat.on, or fares, in the hands of one expert authority.

He was in favour of not allowing certain streets to be used by slow-going traffic during certain hours. There was a large number of carts and other vehicles in the streets that were not fit for public service at all. In Liverpool all carts had to be licensed, and all running authorities in London and the men's unions were in fav ur of a licence to drivers. The raising of the speed of omnibuses would be a very great advantage to traffic generally, and he suggested 16 miles an hour inside the congested area. He favoured the concentration of control in the hands of a non-elected body. They had considered several plans for the extension of the tube system in South London. At present the cost was very heavy.

Mr. C. J. Spencer, manager of the Metropolitan Electric, the London United, and the South Metropolitan Electric tramways, next gave evidence. He referred to the improvement in the service since the Armistice, and said that generally normal traffic requirements were now being met. The increase in fares on the Metropolitan Electric tramways had become inevitable, and whether it would be possible to continue at the present rate was doubtful. The average distance that could now be travelled for 1d. on the Metropolitan Electric tramways was 1.2 miles, and this compared with 1 mile in Leeds and Sheffield, 1.1 mile in Nottingham, 2 miles in Manchester, and 2.3 miles in Glasgow. The average increase in fares on the London United and the Metropolitan Electric tramways amounted to 24.3 per cent.

On Wednesday, Mr. James Devonshire, chairman and managing director of the London and Suburban Traction Company, in giving evidence, said that his company controlled the London United tramways, the Metropolitan Electric tramways, and the South Metropolitan Electric tramways, and was in turn controlled by the group of companies known as the Traffic Combine. The London and Suburban Traction Company had a capital of three and a half millions.

Mr. R. H. Selbie, general manager of the Metropolitan Railway Company, said that his company was responsible for about 88 miles of lines in and round London. The company was independent of

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the Underground combine, but worked in conjunction with that system, and had a comprehensive arrangement for through bookings. They had had the problem of congestion under consideration for some time past, and had had a time-table framed which, it was anticipated, would be able to reduce the time of stops at stations to less than 25 seconds. For many years the fares had been on a lower scale than those authorised, and 90 per cent. of the third-class fares were at present on the basis of less than 1d. per mile. When the Government, in January, 1917, required the controlled railway companies to increase their fares by 50 per cent., his company obtained exemption so far as its London fares were concerned. Of these fares about one-half had been increased from 20 to 50 per cent. since 1917. The increase had been insufficient to meet the increased working expenses. The first essential for the relief of congestion was the release of material for the construction of new electric tramcars. There were thirteen distinct tramway undertakings in the Metropolis, which should be unified. A new supreme authority for traffic should be appointed by the Government, and be answerable only to the Government.

On Thursday, Mr. Charles Watson, representing the London Vehicle Workers' Union, gave evidence and advocated the setting up of a controlling authority whose first business should be to find out the cheapest, quickest and most efficient means of locomotion in the metropolitan area. He thought that the wo d "t amway" ought to be abolished, and "light ailway" substituted. He criticised the present system of fares and advocated the numerical system, so that every stopping place would be a fare stage, and suggested that fares should be abolished altogether, the deficit being made up by the State.

Colonel R. C. Hellard, formerly superintendent of the London Traffic Branch of the Board of Trade, who next gave evidence, said that he was engaged in preparing a report on the London traffic for the information of Sir Eric Geddes. He thought that tramways had reached the maximum of their utility, unless roads were considerably widened. Motor omnibus traffic should be developed, but this would require street and road improvements. He suggested that some central authority should be set up charged with the control of the main roads and be invested with large powers, including power to impose tolls on omnibuses and heavy vehicles. In his view London traffic would continue to increase, and legislation for it ought to look fifty years ahead.

EDINBURGH TRAMWAYS MUNICIPALISED.

The tramway system of Edinburgh was finally transferred from the Edinburgh and District Tramways Company, lessees of the undertaking, to the owners, Edinburgh Corporation, on Tuesday, July 1. The event was celebrated at a luncheon given in the City Chambers. Lord Provost Sir J. L. Macleod, in proposing the toast of success to the Edinburgh Corporation Tramways, said that, as far as tramways were concerned, they were now masters in their own house, and he congratulated the tramways committee on their achievement. Mr. John Harrison, Convener of the Tramways Committee, in replying gave some details of the financial arrangements of the tramways company, which, he believed, had hindered them from making the best of the undertaking, but expressed confidence that the new manager would rapidly get the old rambling system into something like decent working order.

Replying to the toast of his health, Mr. R. S. Pilcher, general manager of the tramways, said he was often commiserated with upon the difficulty of his job, but he did not feel depressed, because the more defects there were the more chance there was to show improvements.

GLASGOW TRAMWAY SEMI-JUBILEE.

The semi-jubilee of Glasgow Tramway system as a municipal undertaking was celebrated on Tuesday, July 1. Under normal conditions, the occasion would have been made a civic festival, in which the whole of the citizens would have taken part, but the Corporation wisely decided to celebrate the event by a purely official function. Invitations were sent to former members of Town Council, ex-Lord Provosts, conveners of committees, former officials, and all who had taken an active part in building up the undertaking. A numerous and representative assembly gathered at the City Chambers, and the company were conveyed to Coplawhill Tramway Works in the tramcars, a notable feature of the procession being a horse-drawn car, which was given the honour of leading the long line of cars. After a tour of inspection round the extensive premises, the company returned in the tramcars to the Municipal Buildings, where luncheon was served in the banquetting hall. Speeches were delivered by the Lord Provost (Mr. J. W. Stewart), the Convener of the Tramways Committee (Mr. Kelly), Sir Samuel Chisholm, Sir John Primrose, Sir Robert Graham, and Mr. Dalrymple, general manager of the tramways. Mr. Dalrymple took the opportunity of explaining that the order for tramway rails given to an American firm was given chiefly because a strike of railmakers in Middlesbrough had rendered it impossible for British firms of railmakers to give delivery. Telegrams of congratulations were exchanged between the Lord Provosts of Glasgow and Edinburgh, and read to the company.

Top Covered Cars for Salford.—Salford Tramways Committee have decided to place top covers on the majority of their cars. The change is made in compliance with the wishes of the public.

LONDON COUNTY COUNCIL TRAMWAYS.

ANNUAL ACCOUNTS.

At the meeting of the London County Council on July 1, the tramways accounts for the year ended March 31, 1919, were submitted together with a memorandum by the general manager on the working of the undertaking. The system on March 31, 1919, extended over a total length of 149·07 street miles, of which 144·47 miles were electric lines (122 conduit and 22½ overhead). The following table gives the total income and the working expenses, compared with the results in preceding years:—

YEAR ENDED MARCH 31	1919	1918	1917	1916	1915	1914
	£	£	£	£	£	£
Income ..	3,578,256	2,932,140	2,552,203	2,339,291	2,399,487	2,268,669
Working expenses* ..	2,858,414	2,128,686	1,817,694	1,683,660	1,700,212	1,615,467
Surplus on working ..	719,842	803,454	734,509	655,631	699,275	653,202
Deductions—						
Debt Charges: Interest ..	264,434	293,568	314,164	326,477	330,300	—
Redemption	430,458	428,319	429,851	425,908	405,605	—
	694,892	721,888	744,015	752,385	735,905	736,602
Rent drawbacks, etc.	—	—	7,551	6,797	1	—
Income tax, etc. ..	109,786	75,661	73,000	40,000	32,102	28,197
Parliamentary expenses ..	—	—	18	2,260	2,803	2,082
Amount due under through-running agreements	—	—	1,528	—	—	—
	804,678	797,549	826,112	801,442	770,811	766,881
Less tax deducted, interest on cash balances, rents, etc.	92,905	89,654	102,945	72,061	38,363	25,153
Total deductions from surplus ..	711,773	707,895	723,167	729,426	732,448	741,728
Balance ..	£8,069 (Surplus)	£95,559 (Surplus)	£11,342 (Surplus)	£73,795 (Deficit)	£33,173 (Deficit)	£88,526 (Deficit)

* Includes war service allowances, 1918-19, £162,128; 1917-18, £119,432; 1916-17 £110,155; 1915-16, £95,365; 1914-15, £42,209.

PASSENGERS CARRIED, OPERATING EXPENSES, ETC., ON ELECTRIC LINES.

Year ended March 31	Average Track Miles	Average Passenger Receipts per Track Mile	No. Passengers	Gross Passenger Traffic Receipts
		£		£
1907	40.66	19,929	188,062,063	810,320
1908	61.91	20,223	270,166,461	1,252,001
1909	77.94	19,752	344,705,937	1,539,434
1910	99.61	18,546	418,317,377	1,847,327
1911	116.98	17,925	482,296,935	2,096,914
1912	127.55	17,498	516,092,489	2,231,902
1913	132.49	16,179	501,102,149	2,143,559
1914	136.62	15,967	516,338,859	2,181,344
1915	140.66	16,516	547,253,332	2,323,130
1916	141.52	16,097	545,247,747	2,278,115
1917	141.67	17,479	586,127,976	2,476,309
1918	141.67	20,206	593,516,141	2,862,554
1919	141.67	24,487	636,157,361	3,469,165

The capital expenditure on the undertaking up to March 31, 1919, amounted to £13,693,751, of which £34,162 represents expenditure during the year 1918-19. The debt outstanding, after allowing for debt repaid out of revenue and sinking fund balances and for £120,216 in respect of the value of surplus land, was £8,349,817 16s. The total amount of debt repaid out of revenue up to March 31, 1919, was £5,133,040, to which is added an amount of £419,760 from proceeds of sales, making in all £5,552,800.

The renewals fund on March 31, 1919, amounted to £261,413. Up to the year 1911-12, full provision for this fund was made out of the revenues of the undertaking on the basis approved on June 23, 1908, of two-thirds of a penny for each car mile run, but the financial results of the working of the past seven years have not enabled provision to be made on this basis. During this period the available surpluses have only been paid into the fund, including in 1918-19 the surplus of £8,069.

The total sum paid to metropolitan borough councils as rates on the permanent way amounted in 1918-19 to £77,723 5s. 8d., and represents an average relief to the rates of London of about ·4d. The saving to the road authorities in consequence of the obligation of the Council to maintain the paving along the tramway routes is estimated by the Council's officers at about £184,000 a year on the present mileage; this estimate being based, of course, on the normal standard of maintenance. The aggregate amount chargeable to the tramways account in respect of the cost of effecting street improvements carried out along tramway routes, is approximately £800,000.

Manchester Loan for New Cars.—The Board of Trade has sanctioned the borrowing by Manchester Corporation of £200,000, the sum required for the building of new cars.

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ELECTRIFICATION OF THE BELGIAN RAILWAYS.

The Special Commission which has considered the electrification of the Belgian State Railways, has submitted a report which is favourable to the proposed change. The Government have approved its conclusions and the electrification of the railways has thus been finally decided upon. The Ministry have appointed four experts, MM., Lamal, administrator, Foulong and Robert, chief engineers, and Colson, electrical engineer, to elaborate a scheme which will enable the electrification of the following lines to be determined upon by August next:—Brussels-Antwerp, Brussels-Luxembourg, to be followed immediately by the Brussels-Ostend line. Energy will be transmitted by overhead wires or by a third rail, as circumstances render convenient. It is hoped that the work can be commenced at the beginning of 1920. The new method of traction will enable the journey to be made from Brussels to Antwerp in 25 minutes. Trains will be run every quarter of an hour, or, if the traffic justifies, every ten minutes. The idea is to have a service as frequent as that of a tramway. After the routes above mentioned have been dealt with, longer lines such as Brussels-Charleroi and Brussels-Tournay will be undertaken.

MISCELLANEOUS NEWS AND NOTES.

A Ministry of Commerce.—Mr. Bonar Law in the House of Commons on Monday, said that it was the intention of the Government that the Board of Trade should be developed to perform all the functions of a Ministry of Commerce.

Berlin Traffic Strike.—The greater part of the railway men of Berlin returned to work on July 3, and goods traffic is proceeding almost normally. The strike of tramway men and omnibus drivers, however, still continues.

Price of Tramway Cars.—Mr. L. E. Harvey, General Manager of Ilford Tramways, has advised his Council that the price of tramway cars will probably not diminish for five years, owing to the enormous demand for cars throughout the country.

Fined for Obstruction.—A lorry driver was fined £1 at Sheffield Police Court for obstructing a tramcar for a distance of 1,150 yards. The lorryman said he did not know he was obstructing the tramcar.

Newcastle Race Day Record.—On Plate Day (Thursday, June 26), of Gosforth Park Races, the takings on Newcastle Corporation Tramways amounted to £4,923, the highest record for any one day in the history of the undertaking. The receipts for the seven days of the race week amounted to £15,998.

Theft of Tramway Tickets.—On a Birmingham Corporation tramcar, a young girl stole 100 workmen's tickets, and next day presented one of the tickets to the woman conductor from whom it had been stolen. Birmingham magistrates put the girl on probation.

Blackpool Town Council has now decided to increase the charges for season tickets on the Corporation tramways. Instead of a uniform charge of £3 per annum, including all sections, the charge will be £6, or £3 for any separate section, for adults; and for children £4 and £2 respectively; and there will be special tickets at 30s. for students, available over any section.

Liverpool Tramway Difficulties.—Last Friday, deputations representing the Municipal Employees' Association and the Amalgamated Association of Tramway and Vehicle Workers were received in succession by the Tramways Committee of Liverpool Town Council. Though no official announcement can be made before the Committee's report is read, we learn that both deputations are satisfied with the results of their interviews.

Refusal to Pay a Fare.—At Lowestoft Police Court, it was stated that a woman had refused to pay the legal fare as a protest against the increased fares and the inefficiency of the service. After defence had been heard, the magistrates imposed a fine of £1, and the husband of the woman, who appeared in her defence, said that it would be a lesson to him not to stick up for the public interest in future.

Toronto Strike Award.—A *Times* telegram states that the street railway employees of Toronto have rejected the proposals of Mr. Harris, acting for the City Council, that the men should return to work at 48 cents (about 2s.) an hour until the company's books are examined. The men have accepted, however, the recommendation of the Conciliation Board that they should receive advances ranging from 50 to 55 cents an hour in the next nine months. The Board's recommendation involves increased fares, and is acceptable neither to the City nor to the company.

Cippenham Motor Depot Inquiry.—The Joint Committee of Lords and Commons, which has been investigating the Government motor repair works at Cippenham, held their final meeting on Thursday and agreed upon their report, which will probably be published early next week. It is understood that their judgment is that at the time the undertaking was instituted it was good policy to establish a central depot for repairs and the storage of spare parts. They are, however, of opinion that the delay in beginning construction caused the waste of large sums of public money, and that after the armistice the decision to continue the work was taken without sufficient consideration of the altered conditions, and without any trustworthy estimate of the financial results. As a commercial proposition the decision to continue the work was not justified by the evidence submitted to the Committee. They suggest that when the repair of the Government motor vehicles has been completed, the Government should reconsider the whole question of the future of the undertaking.

Drayman at Fault.—At the Nottingham County Court, Hansons, Limited, brewers, Kimberley sued the Nottinghamshire and Derbyshire Tramways Company for £4 15s. damages, for injury to a dray caused by collision with a tramcar. The Tramway Company denied fault. It was shown by evidence that the driver of the dray suddenly pulled the vehicle in the front of the tramcar, causing the collision, and Judge Acton gave judgment for the defendants, with costs.

Threatened Strike at Birkenhead.—Rumours have arisen that Birkenhead Corporation Tramway employees are proposing to strike. Last week the Tramways Committee received a deputation from the men, and discussed with them the alleged causes of grievance, the most important being time allowance for meals, appointment of inspectors, overtime rates of pay, rest-days, and learner-drivers' pay. The Tramways Committee arranged substantial concessions to the men on all those points, and understood that the deputation were wholly satisfied. A strike would therefore seem to be unjustifiable, and wholly unfair to the Birkenhead public.

Halifax Tramway's "Majority."—The Tramways Committee of Halifax celebrated last Friday the coming of age of the tramways undertaking by a tea at the White Swan Hotel. The beginnings of the system were two routes, the total length of which was under three miles, and now the mileage of the system measures 37¼ miles, of which nearly 14 miles are outside the borough. In addition, the Corporation has a motor omnibus service, to which large extensions are to be made soon. The original staff numbered about twenty, and the present staff is about 420, including 50 women. The total capital expenditure on the system is £423,532, and a profit of £131,629 has been earned by the tramways during the twenty-one years.

Explosions in Electric Feeder Boxes.—Some alarm and confusion was caused in Sheffield on Monday night by the fusing of the electric apparatus in two feeder boxes, one at the bottom of Ashline Road, and the other at Woodhead Road, on the Heeley and Woodseats section of the Sheffield tramways. In the first box a loud explosion occurred, followed by a sheet of flame. The electric cables were fused, and the effect passing along to the second feeder box another explosion occurred. The effect of the second explosion was to disconnect the electric cables, stopping all the power and light of the tramcars and picture houses in the immediate vicinity. Within a short time, however, firemen and tramway electricians repaired the damage, and the services were resumed next morning.

Demobilised Vehicle Workers Welcomed.—A reception was held in the Albert Hall on Monday evening to celebrate the home-coming of the workers on omnibuses, tubes, and tramcars, employed by the Underground and Combined Companies, after war service. Altogether, 16,000 of the workers had served, and of these 9,000 were now demobilised, 250 having been distinguished and decorated. The associated companies presented the men who had been decorated with souvenir parchments, and Sir Julian Byng performed the ceremony of handing to each man his parchment. Lord George Hamilton presided over the meeting and the T.O.T. Victory Choir of 400 voices entertained the company with the assistance of numerous capable artistes.

PERSONAL.

Mr. C. W. Salt has been appointed borough electrical engineer of Carlisle, at a salary of £600 a year.

Mr. W. Helliwell, an inspector of the Coventry Corporation tramways, has been appointed chief inspector of the Hastings Tramways Company.

Mr. Henry Mattinson, chief civil engineer of Manchester Corporation tramways department, has been recommended by the Tramways Committee for an increase in salary to £800 per annum.

Mr. W. Tuke Robson, who has retired from the position of tramways manager of Southampton Corporation, has received an honorarium of £150 from the Tramways Committee, who have placed on record their high appreciation of his services.

Dublin Tramway Company's Chairman.—At a meeting of the Board of Directors of the Dublin United Tramways Company, on July 1, the Right Hon. L. A. Waldron, P.C., was elected chairman of the Board, in succession to the late Mr. William M. Murphy. Captain Wm. L. Murphy, R.A.M.C., was appointed a director of the company.

Mr. William Chamberlain, general manager of Oldham Corporation tramways, has been recommended by the Oldham Tramways Committee for an increase in salary from £450 to £700 per annum, rising by annual increments of £50 to £800. If the increase be granted, Mr. Chamberlain will undertake not to terminate his engagement within a period of five years.

Hull Tramways Manager.—The following were selected for interview by the Tramways Committee from forty-eight candidates for the position of tramways manager of Hull Corporation: Mr. W. Chamberlain, tramways manager and engineer, Oldham Corporation; Mr. F. A. Fitzpayne, tramways manager, Leith Corporation; Mr. L. E. Harvey, tramways manager and engineer, Ilford District Council; Mr. E. S. Rayner, tramways manager and electrical engineer Doncaster Corporation; Mr. T. C. Richardson, tramways manager, Colne Corporation; Mr. J. F. Simpson, tramways manager and engineer, Preston Corporation; Mr. C. D. Stanley, tramways manager and engineer of the New St. Helens and district tramways; and Mr. H. P. Stokes, tramways manager and engineer of Bexley District Council. As mentioned last week, Mr. Rayner has been appointed to the position.

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FINANCIAL.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended July 2 amounted to £82,039, an increase of £16,496 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to July 2 (thirteen weeks and two days) the total receipts were £1,079,186, an increase of £259,147 on the corresponding period of 1918.

Belfast City Tramways.—The annual financial statement of the general manager, Mr. J. S. D. Moffet, shows that the total revenue was £406,300, an increase of over £51,000 as compared with last year. The traffic expenses totalled £121,217. The car mileage run was 5,254,482, a decrease of over a million miles as compared with the previous year. The traffic revenue per car mile was 18.46d., compared with 13.39d. in the previous year. After payment of interest and sinking fund, there is a net balance of £8,961, which is paid into the general purposes fund.

Serious Position of Lancaster Tramways.—According to the minutes of Lancaster Town Council Tramways Committee, the undertaking seems to be in a rather difficult position. At present there is a net loss of about £700 for the year on the undertaking, and costly renewals are more than due. Various proposals were made by the Councillors in discussing the minutes, ranging from "scrappng" the system to extending and supplementing it by motor omnibus services. The minutes of the Tramway Committee were passed, however, without any motion being made.

Stalybridge, Hyde, Mossley and Duckinfield Tramways Board.—At the meeting of the Board, on Thursday, June 26, Alderman R. Wood, chairman of the Tramways Committee, stated that the revenue for the year showed an increase of £9,000, but that expenses had increased by practically an equal amount. If it had not been for these counteracting increases, the undertaking would have paid its way and given something to the renewals fund. He hoped the time was not far distant when they would cease to ask the four corporations for relief. On the question of acquiring the Hyde section of the Oldham, Ashton and Hyde Tramway Company's undertaking, it was stated that Hyde Corporation were to be the purchasers, but the Joint Tramways Board were working along with the Hyde Town Council, with a view to having the tramways ultimately transferred to the Board.

CONTRACTS AND ORDERS.

Southport Corporation has accepted tenders of the Brush Electrical Engineering Company, Ltd., for two turbine generators and condensing plant at £51,197 and for a transformer at £9,385.

Clough, Smith and Company, Ltd., 36, Victoria Street, Westminster, S.W.1, have been awarded a contract by the London United Tramways, Ltd., for the replacing of the centre poles with span wire construction between Acton and Ealing.

Glasgow Tramways Committee has recommended the acceptance of the following contracts:—Trolley wire, F. Smith and Co., Ltd.; cables, British Insulated and Helsby Cables, Ltd.; axles, Glasgow Railway Engineering Co., Ltd.

The United States Steel Products Company, as mentioned last week, have received an order from Glasgow Corporation for 5,000 tons of rails at £17 per ton, deliveries to be made between July and September. Other tenders received were: Bolckow, Vaughan and Co. (September to December), £19; P. & W. McLellan (September to December) £19; Walter Scott, Ltd. (October to December), £20.

CARS, MOTORS, CONTROLLERS.

(DICK, KERR SYSTEM.)

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TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	June 24	473	522	+ 49	12	6,503	+ 268
Aberdeen Corporation	,, 25	2,480	3,198	+ 718	37	11,822	+ 2,318
Ayr Corporation	,, 28	610	706	+ 96	6	4,126	+ 997
Belfast City	,, 20	7,031	10 395	+ 3,364	12	122,759	+ 31,350
Birkenhead Corporation	,, 29	2,210	2,791	+ 581	12½	34,323	+ 6 825
Birmingham Corporation	,, 21	23 644	25,543	+ 1.898	12	310,248	+ 36,476
do. Motor Buses	,, 21	1,466	1,777	+ 311	12	21,071	+ 3,230
Blackburn	,, 25	1,636	2,240	+ 610	13½	32,005	+ 8,140
Bradford Corporation	,, 28	9 699	10,977	+ 1,278	13	146,991	+ 37,054
Burnley Corporation	,, 28	2.200	3,149	+ 949	..	..	..
Burton-on-Trent Cor.	,, 29	399	472	+ 73	13	6,146	+ 1,047
Bury Corporation	,, 29	2,069	2,809	+ 240	12½	31,870	+ 5,775
Chatham & District	,, 19	1,330	1,791	+ 461	24	34,203	+ 4,178
Cork Electric	,, 19	653	771	+ 118	24	14,723	— 237
Derby Corporation	,, 28	1,466	1,951	+ 485	13	24,499	+ 5,238
Dundee City	,, 25	1,861	2.523	+ 662	5½	14,576	+ 3,233
East Ham Corporation	,, 28	1,516	1.809	+ 293	12½	24,668	+ 6,410
Glasgow Corporation	,, 28	29,974	32.880	+ 2,906	4	133,055	+ 13,453
Glossop (U.E. Sup. Co.)	,, 28	178	222	+ 44	26	5,832	+ 1,092
Halifax Corporation	,, 24	2.523	3,351	+ 828	12½	44,695	+ 11,152
do. Motor Buses	,, 24	58	82	+ 24	12½	1,003	+ 260
Huddersfield Corporation	,, 28	3,242	4,684	+ 1,442	13	63,766	+ 15,953
Ilford U.D. Council	,, 28	1,023	1,266	+ 243	13	16,115	+ 3,554
Ipswich Corporation	,, 29	739	921	+ 182	13	11,476	+ 2,208
Isle of Thanet	,, 25	288	1,389	+ 1,101	38½	20,502	+ 12,634
Kilmarnock Corporation	,, 28	235	298	+ 63	6½	1,862	+ 352
Lanarkshire	,, 12	3.659	4,069	+ 410	24	80,240	— 3,658
Leeds City	,, 28	13,807	16,432	+ 2,625	13	218,637	+ 62,501
Leicester Corporation	,, 28	4.540	5,792	+ 1,252	..	..	..
Leyton U.D. Council	,, 26	2,198	3,100	+ 902	13	41,121	+ 14,020
Liverpool Corporation	,, 28	18,892	22,785	+ 3,893	25½	552,554	+ 105,459
Llandudno & Colwyn Bay	May 16	367	523	+ 156	24	8,556	+ 1,676
London County Council	July 2	65,543	82,039	+ 16,496	12½	1,079,186	+ 259,047
Maidstone Corporation	June 26	268	352	+ 84	12½	4,793	+ 1,286
Manchester Corporation	,, 28	25,025	30,305	+ 5,280	13	395,998	+ 73,279
Newcastle-on-Tyne Cor.	,, 14	9.159	10,242	+ 1,083	11	100,090	+ 3,147
Northampton Cor.	,, 20	812	1,289	+ 477	12	15,419	+ 4,857
Nottingham Corporation	,, 28	5,857	6,844	+ 987	13	90,122	+ 17,224
Oldham Corporation	,, 29	3,434	4,372	+ 938	14	61,475	+ 13,067
Reading Corporation	,, 29	1,312	1,569	+ 257	12½	19,828	+ 4,030
Rotherham Corporation	July 2	2,287	2,084	— 203	13½	30,496	+ 2,018
Sheffield Corporation	June 29	13,234	16,399	+ 3,165	13½	233,724	+ 48,576
Southampton Cor.	,, 25	2.561	2,677	+ 115	12½	34,020	+ 2,938
Southend-on-Sea Cor.	,, 11	1,089	3,388	+ 2,299	11	19,912	+ 10,124
South Shields Cor.	,, 14	1,129	1,467	+ 337	11	15,057	+ 3,121
Sunderland Corporation	,, 29	2,148	2,895	+ 747	13	37,873	+ 10,683
Swindon Corporation	May 14	280	335	+ 55	6½	2,031	+ 180
Torquay Tramways	June 19	862	1,253	+ 391	24	22,185	+ 3,533
Tyneside Trys. & Trmrds.	,, 11	1,165	1,522	+ 356	24	22,407	— 61
Wallasey Corporation	,, 27	1,912	2,485	+ 573	12½	32.764	+ 9,581
Walsall Corporation	,, 28	1,192	1.298	+ 106	13	18,255	+ 2,587
Walthamstow U.D. Coun.	,, 28	1,583	1,677	+ 94	13	23,534	+ 4,915
Warrington Corporation	,, 26	726	851	+ 125	12	11,158	+ 1,962
West Ham Corporation	,, 26	4,288	5,446	+ 1,158	12½	70,723	+ 17,163
Wolverhampton	July 2	1,654	1,862	+ 208	13	27,028	+ 3,289

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	June 24	£50,966	£56,145	25	£1,369,551	+ £11,607
Auckland (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,282
Ballarat and Bendigo (4 wks)	Apr. 27	4,095	4,291	4	4,291	+ 196
Brazilian Traction (Mlrs.)	Apr.	8,830,000	9,208,000	17	35,032,000	+ 3,456,000
Brisbane	Apr.	35,530	32,775	17	151,110	+ 13,541
British Columbia $	Apr.	515,417	631,988	43	6,022,107	+ 1,011,419
Buenos Aires Lacroze	May	41,315	47,317	48	481,503	+ 52,123
Burmah Tram. & Light Rs.	Apr. 30	27,614	36,815	39	325,985	+ 86,230
Calcutta Rs.	June 7	72,740	80,143	22½	..	+ 241,797
Cape Town	May	..	23,405	..	..	..
Carthagena and Herrerias	June	5,047	3,373	26	16,791	— 10,841
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	May	1,920	2,131	43	19,679	+ 5,472
Hong Kong $	May 10	12,082	14,786	19	269 714	+ 1,5586
Kalgoorlie	Feb.	2.373	2,278	8	4,840	— 55
La Plata	May	5,105	5,702	22	29,352	+ 4,274
Lima	Apr.	42 557	49,968	17	92 681	+ 10,652
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	May 31	41,152	45,875	21	364,068	— 29,811
Manaos Rs.	Aug.	150,657	132,507	34	1,152,686	+ 83,959
Manila $	Apr.	163,500	212,788	17	863,353	+ 192.193
Montevideo	May	32.301	37,382	31	265,287	+ 26,943
Para	,,	24,925	24,503	26	147,480	+ 3,339
Pernambuco	June 22	4,539	5,642	24½	134,989	+ 21,875
Peruvian $	Feb.	925,410	948,470	34	7,973,885	— 229,195
Port Elizabeth	May	..	5,145	...	...	...
Rangoon	May	5,719	6.533	21	32.350	+ 3,768
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore $	May 17	13,430	14,489	20	311.217	+ 41,251
Toronto $	Apr.	1,065,766	1,051,960	17	4,257,882	+ 22,392
Winnipeg $	Mar.	307,289	384,937	13	1.146,638	+ 205,608

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SATURDAY, JULY 12, 1919.

THE ECONOMIC VALUE OF COAL.

It is now nearly three-quarters of a century since Carlyle warned the English-speaking world that the problem of fixing "a fair day's wage for a fair day's work" would become increasingly difficult to solve, and that upon its solution depended the whole future of civilisation. All these years the prophet's prediction has been either flouted or calmly disregarded, and now the British people are faced with the situation which Carlyle foresaw. Miners, engineers, tramwaymen, railwaymen and other workers have demanded and obtained shorter hours and higher wages, successively raising their demands, until shrewd observers of less than prophetic gift have predicted a serious crisis in the economic and industrial affairs of the nation. The first stage in the crisis has come in the shape of the Government announcement in the House of Commons on Wednesday night that the price of coal must be increased by six shillings per ton on and after July 16th. On the face of it, the decision is of the most serious character. Tramway undertakings, to confine the view to a single industry, have experienced great difficulty in obtaining the increases in fares necessary to meet the added costs of operation, but the increase of the price of coal by six shillings per ton precedes the necessity of still higher fares. Tramway undertakings depend, of course, fundamentally on coal. Not only is it essential for their power supply, but there is not an item in their equipment which does not come from furnace or forge, from power-driven machinery or tools. Before alarm rises to panic height, however, it is advisable to await the further information that Government has promised to publish without delay. The suggestion that the increase is merely a move on the part of the Government to counter Labour's threat of direct action is purely partisan, but it may be asked —have all the other available means been exhausted for reducing the costs and the speeding-up of production? This is one of the many questions which the industrial community is entitled to ask and to receive direct, accurate and speedy answers to. That the Government think they have a strong case is shown by their readiness to offer facilities for debating the question in Parliament, and the public eagerly await the outcome of Monday's discussion in the House of Commons. It is not too much to say that the whole future of tramway undertakings depends largely upon the issues at stake. No one is so sanguine as to hope that the whole wages problem will be settled by a House of Commons debate, but it may be the starting-point of a healthy reaction.

TRAMWAYS AND LIGHT RAILWAYS ASSOCIATION.

The Journal of the Association for July contains the formal notice of the ordinary general meeting of the Association, which will be held at 2.30 p.m. on Friday, July 25, at Caxton Hall, S.W. Following the annual meeting, papers will be read by Mr. W. L. Madgen on "Tramway Fares and Services," and by Mr. Harry England on "Post War Conditions and Their Effect upon Tramway Undertakings." The annual dinner will be held at 7.30 at the Connaught Rooms, Kingsway, W.C., and applications should be sent to the Secretary, Sanctuary House, 33, Tothill Street, S.W.1.

The Journal contains also a list of decisions on the Terms of Agreement of March 20, 1919, and a list of the members of the Conference of Tramways and Light Railway Companies which was constituted on May 10 last.

LONDON TRAMWAY BILL.

In the House of Commons on Thursday Mr. Vaughan-Davies moved that the Resolution of the Select Committee on Standing Orders of May 28 with respect to the London County Council (Tramways and Improvements) (Petition for Bill) should be referred back to the Committee, and that they should have power to inquire whether there were any special circumstances which rendered it just and expedient that the Standing Orders should be dispensed with in respect of Part V. of the Bill referred to in the Petition and the provisions relating thereto. Mr. Vaughan-Davies said he had objected to provisions affecting the area outside the County Council area of London, but these objectionable features had now been withdrawn, and the County Council were now simply asking for powers within their own area and affecting their own omnibus arrangements.

The motion was agreed to.

REASONS FOR INCREASE IN LONDON FARES.

In reply to criticisms of the increase in the L.C.C. tramway fares, the Highways Committee have explained the necessity for the increases. The principal reason is the recent agreement with the National Transport Workers' Federation, whereby a 48-hour week was instituted and other concessions were granted. These involve an increase in annual expenditure of £300,000, or nearly £1,000 a day, in addition to previous increases. The price of coal and of all materials has advanced, in many cases more than 100 per cent. As a result the cost per car mile has steadily increased, as shown in the appended table :—

Year.	Working expenses (including war service allowances).	Pence per car mile.
1913-14	£1,585,251	6.50d.
1914-15	1,684,243	6.89d.
1915-16	1,683,660	8.44d.
1916-17	1,817,693	8.82d.
1917-18	2,128,685	10.38d.
1918-19	2,858,414	14.27d.
*1919-20	3,531,925	15.99d.

Year	Car Miles	Wages Bill
1913-14	59,209,289	£1,102,220
*1919-20	53,000,000	2,421,250

* Estimated.

From the above figures it will be seen that as compared with the year 1913-14, it is now necessary to raise a sum of nearly £2,000,000 a year in order to cover the increase in working expenditure. The Committee is satisfied that little can be done in effecting further economies, and that the extra sum can be provided only by increases in fares or by making the tramways a charge on the rates, a course which has never been contemplated by the Council. In the scheme for increasing fares the increases were limited to the absolute necessity of the situation. It will be necessary during the current year to obtain over £1,000 000 more than the revenue for last year. The suggestion that the re-payment of capital borrowed for financing the undertaking be suspended is impracticable, as the Council has no control over this matter, the repayment of borrowed money being required by Parliament of all local authorities, the terms being fixed with the approval of the Treasury. The Committee feel strongly that an overwhelming case has been made out for the necessity of the increases made in the fares, the sole object of which is to balance expenditure and revenue, and have furnished to every member of the Council a list of the new fare stages. In the meantime they deprecate some of the uninformed criticism which has been levelled at the new scheme of fares, which is calculated to divert to privately-owned undertakings traffic receipts which would otherwise go to the public funds.

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L.C.C. TRAMWAY MATTERS.

TRAMWAYS NOT TO BE A CHARGE ON THE RATES.

At meetings of the Council during this month discussions have taken place on the annual estimates, in the course of which Mr. H. H. Gordon observed that the principle had been definitely settled by the two big parties on the Council that the tramways should not become a charge on the rates. They were also agreed that no unfair burden should be placed on the undertaking which would create what was really a fictitious deficit.

Mr. W. J. Squires, chairman of the Highways Committee, in replying to the discussion, said that no more than any other body in this country had the Council been relieved of the hardships of the war. The Government told them there was not the slightest chance of railway fares being reduced, and on behalf of the Council he must tell them that at the present time there was no chance of the tramway fares being reduced. A special committee was considering possible ways in which fares could be revised, and a report would be presented later. There was a general understanding among the members that the tramways should be self-supporting, and the Highways Committee had always acted on that principle.

REPAIR OF CARS.—When reporting on March 4 in regard to the shortage of cars and the efforts that have been made to overcome the shortage, the Highways Committee stated that a large number of cars had been placed out of service owing to the breakage of axles. On March 26 there was a shortage of 65 motor cars and 3 trailers, which compared with a shortage of 195 on February 20. The supply of stores has somewhat improved, and on June 26 the shortage had been reduced to 36 motor cars.

TRAMWAYS IMPROVEMENTS BILL, 1919.—The Bill for tramway improvements, under which powers were sought for the construction of several new tramways and to enable the Council to own and run omnibuses for the purpose of linking up tramway dead ends was deposited on April 16, and referred to the Examiner of Standing Orders. As provided by the Standing Orders of Parliament, the Bill should have been deposited on or before December 17, 1918. Owing, however, to the armistice taking place in November, there was insufficient time after that date for the Council to comply with the Standing Orders, but the House authorities made it known that notwithstanding the Standing Orders, late Bills would be considered. After a lengthy consideration, however, the Standing Orders Committee came to the decision that the Bill could not be proceeded with. Replying to a deputation appointed by the Council, the President of the Board of Trade suggested that the Council drop the tramway proposals and concentrate on the provision of powers for running of motor omnibuses. The Committee proposed that the suggestion of the President of the Board of Trade should be adopted, and that steps should be taken to secure the recommittal of the Bill so far as it relates to the motor omnibus service.

TENDERS FOR TRAMWAY CONSTRUCTION.—At the meeting of the Council on July 8, the invitation of tenders was approved from selected firms for the construction of the authorised tramways from Lee Green to Eltham, and in East Hill and High Street (Wandsworth), for the provision of ticket punch machines, and for the removal of refuse from tramway conduits.

TRAMWAY MAP AND GUIDE.—The Stores and Contracts Committee have made arrangements for the printing of additional copies of the tramways map and guide.

LIGHT RAILWAY PROPOSALS.

The Scottish Employment Council has considered a report by the Caithness and North of Scotland Employment Committee in connection with reconstruction in Inverness and Sutherland with reference to the establishment of light railways in the Wick, Gills Bay, Thurso, Scrabster and Lochinver areas. The Council also considered a report as to the desirability of a light railway in the Logiealmond district of Perthshire. As the Rural Transport Committee were to take evidence on the proposals, it was decided that the report should be sent to them.

The County Council for the Holland division of Lincolnshire has received a letter from the Board of Agriculture, stating that the light railway scheme of the Council had been considered by the Board. Owing to the heavy expense involved and the fact that many similar proposals had been received from other Councils, the Board does not feel justified in supporting any proposal for light railway construction, wholly or largely at the cost of the State, until certain experimental transport services contemplated by the Department have been in operation long enough to furnish data for the consideration of further cases.

The Board of Trade recently confirmed the Trafford Light Railway Order, 1919, authorising the construction of a light railway in the County Palatine of Lancaster.

New Cars for Ilford Tramways.—The Tramways Committee of Ilford, on the recommendation of the manager, Mr. L. E. Harvey, propose to obtain ten new cars. Mr. Harvey reports that the condition of the present rolling stock gives him cause for much misgiving. While of good design originally, the cars are now in a very unsatisfactory state. The trucks have been patched up again and again, and the car bodies are in a "parlous condition." The contractors for the six new cars recently ordered would build ten more at approximately the same price if ordered at once, and would deliver next March.

PROGRESS OF TRAMWAY BILLS.

Birmingham.—Birmingham Corporation Tramways Bill has been passed for third reading in the House of Commons. The Bill contains plans for the construction of five tramways, four of them continuous, beginning on the north of Selly Oak and running south and west to the borough boundary along the Bristol Road, one of Birmingham's main arterial thoroughfares. Powers to construct certain of those tramways were already possessed by Birmingham Corporation by an Act passed in 1914, but the war had postponed construction and improved plans had been made. It is estimated that the method of construction now proposed will effect a saving of £12,000 per mile of double track.

Walsall.—Consideration of the General Powers Bill promoted by Walsall Corporation has been continued for several days by the Local Legislation Committee of the House of Commons. The aim of the Bill is to provide tramway facilities for the district round Walsall, an important part being the provision of means by which the inhabitants of Sutton Coldfield and district would be enabled to travel freely to Sutton Park and Birmingham. Cannock Urban District Council are the principal opponents of the Bill, and they are promoting a Bill for themselves, seeking certain powers in relation to tramway construction.

Middlesbrough.—The Bill promoted by Middlesbrough Corporation seeking powers to extend its tramway system and to provide services of motor omnibuses, has been passed for second reading in the House of Commons.

Stockton-on-Tees.—In several particulars, the Bill promoted by Stockton-on-Tees Corporation was competitive with the Middlesbrough Corporation Bill. But the differences having been adjusted, the Bill was passed for second reading.

West Hartlepool.—In the Bill before the Select Committee of the House of Lords, West Hartlepool Corporation sought powers to run motor omnibus services along the Tees Conservancy Road, and to extend their tramway system in other directions. The estimated cost of the scheme was £45,000, exclusive of the making of arterial roads.

Bills Passed.—East Ham Corporation Bill and London Electric Railways Bill have been read for a third time in the House of Lords and passed.

MISCELLANEOUS NEWS AND NOTES.

New Cars for Accrington.—Accrington Tramways Committee propose to purchase four bogie cars, two of the double deck and two of the single deck type.

The Transport Bill came before the House of Commons for the third reading on Thursday, when Sir Eric Geddes made an interesting speech on the objects and purposes of the bill. After a long debate the bill was read a third time with a singular result—245 for the bill and 0 against, the tellers against the bill receiving no support.

Fares at Wigan.—Having received no answer to their complaint regarding the fares charged by Wigan Corporation Tramways Department on the Standish route, the Standish Rural District Council has resolved to communicate with the Board of Trade on the subject.

Tramway Extensions at Swansea.—The Swansea Highways Committee have decided, on the recommendation of the surveyor, to seek parliamentary powers for the construction of a new tramway from Morriston to Skewan, and to run motor omnibuses within and without the borough.

Track Repair at Kirkcaldy.—In the report of the Kirkcaldy Corporation tramways for the past year, it is stated that the track is being kept in repair by old methods, and it is estimated that the cost during the coming year will be £2,000. A welding plant has been ordered, and after the joints have been welded, it is hoped that the cost of repairs and up-keep will be considerably reduced.

Improperly Starting a Car.—For ringing a bell and starting a car on the Birkenhead Corporation tramways, a youth was fined 10s. Mr. Hime, who prosecuted for the Corporation, said that the practice of unauthorised persons ringing the bell was a source of danger for old and infirm persons who might be mounting or dismounting.

Extended Tramway Connections.—Giving evidence before the House of Lords Select Committee appointed to consider West Hartlepool Corporation Bill, Mr. J. B. Hamilton, general manager of Leeds Corporation Tramways, gave it as his opinion that, in ten years, the routes proposed would form part of a service linking up the Hartlepools, Middlesbrough, Stockton and Thornaby.

Paisley Fare Increase Opposed.—Paisley Town Council will oppose the application of the Paisley and District Tramways Company for power to increase their fares. The Council consider that as the company have the use of the streets without payment of any wayleaves, they are under an obligation to adhere to the fares fixed by Act of Parliament.

Dunlop's New Tire Tread.—All motorists will be keenly interested in a new and improved pattern of the Dunlop motor cover. This cover will be known as the Dunlop 1919 grooved pattern. The new tread continues the essential features of the grooved design, giving a highly effective non-skidding pattern, together with the maximum durability as the bulk of the tread rubber is disposed along the line of maximum wear. Although rapid progress is being made with the company's new factory, it will still be some few months before it will be possible to give deliveries in all sizes of tires.

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Electric Tower Wagons.—Horse-driven tower wagons have hitherto been used for the inspection and repair of the overhead equipment of London County Council tramways, but the Council have now decided to obtain four electrically-driven tower wagons, together with the necessary battery charging plant, at an estimated cost of £7,000. It is anticipated that with the use of the new equipment much time will be saved and the regularity of the service improved.

British Rolling Stock and the War.—Mr. Foster, Financial Secretary to the War Office, has stated in the House of Commons that the rolling stock transferred from British railways and sent abroad during the war comprised 529 locomotives, 30,021 wagons, 31 ambulance trains and 16 other trains. Such of this material as is not now required abroad is being returned as rapidly as available transport permits. Already 439 locomotives, 3,000 wagons and 13 other trains have been returned.

Gattie Transport Scheme.—Sir A. Geddes has stated that a committee are investigating Mr. A. W. Gattie's proposals for improving the method of handling goods in traffic, and to consider the practicability of the introduction of any of the suggested improvements into the existing transport system. The committee will consist of Sir J. Fortescue Flannery, Bt., Sir John Aspinall, Mr. F. T. Hopkinson, General Sir Philip Nash and a representative of Labour. It has not yet been decided whether the inquiry will be public.

Fine for Obstructing a Car.—Charles Morris was summoned at Kilburn recently for obstructing the passage of a tramway car with his motor lorry in Station Road, Harlesden. The evidence showed that the motor was drawing a trailer and that the driver continued on the track in front of the car for a considerable distance. There was no other traffic at the time and he could have pulled to one side or the other. The motorman sounded his gong, but the defendant took no notice. He was fined twenty shillings and one guinea costs.

St. Anne's Council Purchase Tramways.—St. Anne's-on-Sea Urban Council have decided, subject to the sanction of Parliament, to purchase the undertaking of the Blackpool, St. Anne's and Lytham Tramways Company, Ltd., for £140,000. The tramway has a route length of 7.47 miles. Gas power was originally used, but electric traction was introduced in 1904. The company has a share capital of £125,000, and the debentures amount to £150,000. The revenue for the year ended December 31, 1918, was £44,348, and the working expenses £34,000, leaving a balance of £10,348 for debenture interest. The arrears on debenture interest amount to £47,375.

Strike of Southend Tramway Men.—Southend tramway employees ceased work on Monday evening, the cause being non-compliance with their demand to be paid the same rate of wages as is paid to London tramway men. Employees from other municipal departments, including electricians, gas stokers, power men, engine drivers, etc., struck on the following day. A partial electricity and gas supply was maintained by engineers who are not members of the men's union. On Wednesday the General Purposes Committee of the Corporation decided to recommend the Council to offer the men a 44-hour week and to grant an advance of 15 per cent. on wages as distinct from bonus. Improved rates of pay for overtime and Sunday work are also recommended. These increases, however, are not to be applicable to tramway drivers and conductors, in view of the extra pay already granted to them.

Routes Must Share Services.—Replying to the protest by Burley-in-Wharfedale District Council regarding the inadequate service of trackless cars to the village, Mr. J. B. Hamilton, general manager of Leeds Corporation Tramways, points out that the service between Guiseley and Burley has been very unsatisfactory for a considerable time, owing to the difficulty in getting necessary parts to maintain the cars. He expresses the hope, however, that this difficulty will be overcome very shortly and that the service will then be considerably augmented. In reply to the Council's criticism relating to the occasional diversion of the Burley car on to the Otley route, Mr. Hamilton says a give-and-take principle between the two routes is the best in the interests of both districts, but he hopes soon to be in a position to supply sufficient services to both Burley and Otley.

Exeter Tramway Staff Outing.—The staff and employees of the Exeter Corporation tramways enjoyed their annual outing on July 5, when a tour of nearly 100 miles was made by motor char-a-bancs. With Mr. R. O. Baldwin, the general manager, practically the whole of the staff met at the depot at 6.45 a.m., and the party proceeded to Okehampton, where refreshments were served. The next stop was at Lydford, and luncheon was taken at Brentor. Thence the party went on to Princetown, where tea was served, and to Teignmouth. The concluding stage of the journey was to Ashburton with a halt at Dartmeet. The party returned from Teignmouth by train, arriving at Exeter about 10 o'clock. During a halt in the journey, Mr. Baldwin welcomed back those of the staff who had seen service with the colours. Some thirty-two men had returned from war service, and he regretted that two men who had been badly wounded were not able to be with them. Recalling the fact that this was the second annual outing he had attended, Mr. Baldwin thanked the men for their loyalty during the past year, and asked their assistance in the future to secure the continued success of the undertaking. Mr. Baldwin was cordially thanked on behalf of the men for his assistance in the arrangements that made the outing so successful.

Railless Omnibus Service for York.—York Tramways Committee have approved the trackless trolley system to the Heeworth district by way of St. Saviour's Gate and Haworth Road, Heeworth, to the end of Stockton Lane. The length of the route is 1.33 miles, and the estimated cost of the overhead construction is £3,688, and of the four railless vehicles, £8,000. The scheme now awaits the approval of the City Council.

American Orders from South Africa.—Mr. Houston asked the President of the Board of Trade whether he was aware that recently the Union of South Africa Government had placed in the United States orders for 44,000 tons of rails, 1,000 cars, 200 trucks, and in the United States and Canada, 70 large locomotives, and whether he could state the reason for placing these important orders for material in America instead of in this country. Lieut.-Colonel Amery, in reply, said that some of the orders referred to were placed before the armistice, when it was impossible to supply railway material from this country. As regards the 70 locomotives which has been ordered since the armistice, he had been informed that the British offers in respect both of price and the date of delivery were so unfavourable that the South African authorities felt themselves obliged to go further afield. Forty of the locomotives had been ordered in Canada. Contractors in this country could not expect preference from other Governments in the Empire except as against foreign countries.

British Electric Traction Co.—Mr. Emile Garcke presided at the twenty-third ordinary general meeting of the British Electric Traction Company, Ltd., on July 3. In moving the adoption of the report, the chairman said that the accounts showed a revenue of £250,213, or £12,308 more than for the preceding year. On the other hand the expenses were £36,889, or £8,205 more. Including the balance brought forward of £112,116 and deducting debenture interest (£90,449) there was an available balance of £234,991. They had placed £21,486 to reserve and proposed to pay £82,552 in dividends, viz., 6 per cent. for the year on the preference stock and 3 per cent. on the ordinary stock, the same rates as were paid for the preceding year, and to carry forward £130,952 to the next account. On the whole of their investments for the past year the average yield had been 5.08 per cent., against 4.93 per cent. for 1917. The prospects for the present year were good in some respects, but uncertain in others. The question of fares on the tramways and omnibuses and of charges for electricity had always been a vital factor of their business. However much they might economise, their efforts could only inadequately compensate for the depreciation in the purchasing value of the penny when applied to the payment of wages and the purchase of material. The chairman referred at some length to the Ways and Communication Bill and the Electricity Supply Bill

PERSONAL.

Mr. R. C. Bullough, general manager of Colchester Corporation Tramways, has been granted an increase in salary.

Major Arthur C. Baker, who was assistant electrical engineer of the Birmingham Corporation Tramways, and enlisted early in the war as an air mechanic, has just returned to his duties. He was granted a commission early in 1917, and has been demobilised with the rank of major.

Mr. J. Beckett, borough treasurer of Accrington, has been appointed general secretary of the Municipal Tramways Association. There were 740 applicants for the position, of whom six were selected for an interview by the Committee of Appointment. Mr. Beckett has occupied his present position for thirty-five years, and is well known as a capable and energetic officer.

Mr. T. P. Sykes, technical assistant of the Bradford Corporation tramways, has been appointed general manager of Rotherham Corporation tramways, subject to confirmation by the Council. Mr. Sykes, who is 37 years of age, and has served the Bradford tramways for 19 years, received his mechanical and technical training at Bradford Technical College.

At a recent meeting, Belfast Town Council passed a resolution granting **Mr. J. S. D. Moffet,** general manager of the tramways, a war bonus at the rate of 10 per cent. on the salary he received up to July 1, 1918, but making the bonus date from July 1, 1919. It seems that the Belfast Council considers Mr. Moffet to have been entitled to the war bonus in July, 1918, but fails to recognise that he ought to be paid the arrears due from that date. Instead the Council pays the bonus on the smaller salary and begins payment eleven months after it was due. Belfast Town Council is enjoying the most rare advantage of having it both ways.

To mark the transfer of the Edinburgh tramways from the Edinburgh and District Tramways Company to the Edinburgh Corporation, the general manager of the Tramways Company, **Mr. J. R. D. Cox,** has been presented with a handsome silver tray, Mr. Robert Aitken, in making the presentation, referred to the pleasant relations which had constantly existed between the manager and the employees, and the sympathetic way in which Mr. Cox has always received representatives on their behalf. Mr. Cox remains for the present in the service of the Edinburgh and District Tramways Company.

New Tramway Shelters for Glasgow.—Proposals have been made to erect tramway shelters at Paisley Road Toll and Shawlands Cross. It has been suggested that a closed shelter would be most suitable for Shawlands Cross, while an open one is thought sufficient for Paisley Road Toll. Definite plans have not yet been approved.

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FINANCIAL.

Gravesend and Northfleet Electric Tramways, Ltd.—The accounts for the year 1918 show a profit of £5,179 after providing £9,634 for repairs, renewals and maintenance, and meeting debenture interest of £5,012. A dividend at the rate of 3 per cent. has been declared, £1,000 carried to reserve, and £1,737 forward.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended July 9 amounted to £82,064, an increase of £15,554 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to July 9 (fourteen weeks and two days) the total receipts were £1,161,362 an increase of £274,812 on the corresponding period of 1918.

Wewyss and District Tramways.—For the year 1918 the profit was £7,530, and including £288 brought forward there was an available sum of £8,358. A further dividend of 6 per cent. on the ordinary shares is recommended, making 10 per cent. less tax for the year. In addition to the 6 per cent. on the preference shares, an extra distribution is made of 1½ per cent. The reserve fund is brought up to £8,000 by the sum of £3,000, and £1,046 is carried forward.

Kirkcaldy Corporation Tramways.—The total income for the year ended May 15, 1919, amounted to £28,060, and the working expenses to £19,695, leaving a gross profit of £8,365, equivalent to 8·38 per cent. on the capital expenditure. After providing for interest on capital (£3,208), sinking fund £(2,217), depreciation, etc. (£614), there is a balance of £2,326, as compared with £396 last year. The average traffic revenue per mile of single track was £3,138, compared with £2,379 a year ago, and the average revenue per car mile was 16.036d., against 11.933d. Operating costs amounted to 11.26d. per car mile, as against 8.52d. The present scale of fares came into operation on August 12, 1918. Although it is doubtful whether the present revenue is large enough to meet future expenses, the Committee suggest that the fares should not be again increased until further experience is obtained.

CONTRACTS AND ORDERS.

Fodens, Ltd., are to supply a 5-ton motor lorry, including a tank for street watering, to Heanor Council at £1,290.

The Lacre Motor Company, Ltd., have an order from Bradford Corporation for three Lacre motor street sweeping machines, each with sprinkler attached, at £577 10s. each complete.

The general manager of Sheffield Corporation tramways has reported to the Sub-Committee that the **Brush Electrical Engineering Co., Ltd.,** have offered to supply immediately from stock one single deck motor omnibus body of a special design, at a cost of £475, and the Sub-Committee have recommended that the offer be accepted.

Motor Garage and Petrol Storage at Sheffield.—The Sheffield city architect has been asked by the Corporation to prepare plans and estimates for the construction of a new garage on the land adjoining Worthing Road tramway depot. The Tramways and Motors Committee have approved the tender of the Steel Barrel Company, Ltd., of Uxbridge, for the supply of a 1,000 gallon petrol storage installation complete, at £152.

Sandberg's "In-Situ" Treatment.—The Manchester Corporation Tramways Committee, after an extensive trial of Sandberg's "In-Situ" treatment, have recently placed an order with Messrs. Scholey and Company, Ltd., 56, Victoria Street, London, S.W.1, the licencees for the process, for the immediate treatment of about eight miles of single track. The encouraging reports from undertakings where the treatment has been applied, afford ample evidence of the foresight of the Manchester Committee, which was one of the first Committees to appreciate the possibilities of the process, and no doubt evidence of the material advantages of their enterprising policy will soon be forthcoming.

Accident in Ipswich Power Station.—While Mr. Norman Brooksbank, assistant superintendent of Ipswich Electrical Power Station, was making some alterations at the back of the switchboard to provide for extensions now being made, an accidental contact occurred. As a result, Mr. Brooksbank sustained severe burns and electric shock. The accident caused a complete cessation of Ipswich tramway service, and a temporary interruption to the power supply.

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(DICK, KERR SYSTEM.)
THE
ENGLISH ELECTRIC COMPANY LIMITED,
Queen's House, Kingsway,
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TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAME.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	July 2	491	521	+ 30	13	7,023	+ 297
Aberdeen Corporation	,, 2	2,746	3,382	+ 636	4½	15,205	+ 2,954
Ayr Corporation	,, 5	723	807	+ 84	17	4,925	+ 1,070
Belfast City	,, 4	7,619	10,323	+ 2,704	14	143,367	+ 37,465
Birkenhead Corporation	,, 6	2,349	2,963	+ 614	13½	37,276	+ 7,428
Birmingham Corporation	June 28	23,401	25,496	+ 2,094	13	335,744	+ 88,571
do. Motor Buses	,, 28	1,537	1,677	+ 140	13	25,748	+ 3,369
Blackburn ,,	July 2	1,858	2,164	+ 306	14½	34,170	+ 3,497
Bradford Corporation	,, 5	9,726	11,038	+ 1,312	14	158,029	+ 35,366
Burnley Corporation	,, 5	2,254	2,873	+ 619	..	..	..
Burton-on-Trent Cor.	,, 6	409	489	+ 80	14	6,635	+ 1,127
Bury Corporation	,, 6	2,320	2,369	+ 49	13½	34,238	+ 5,824
Chatham & District	June 26	1,349	1,550	+ 201	25	35,752	+ 4,378
Cork Electric	,, 26	700	733	+ 33	25	15,456	— 204
Derby Corporation	July 5	1,486	1,962	+ 476	14	26,461	+ 5,714
Dundee City	,, 2	1,943	2,584	+ 641	6½	17,163	+ 3,875
East Ham Corporation	,, 5	1,561	1,848	+ 287	13½	26,546	+ 6,697
Glasgow Corporation	,, 5	29,442	32,777	+ 3,335	5	165,832	+ 16,342
Glossop (U.E. Sup. Co.)	,, 5	178	209	+ 31	27	6,042	+ 1,124
Halifax Corporation	,, 1	2,759	3,540	+ 781	13½	48,236	+ 11,933
do. Motor Buses	,, 1	61	86	+ 25	13½	1,089	+ 286
Huddersfield Corporation	,, 5	3,550	4,730	+ 1,180	14	68,496	+ 17,132
Ilford U.D. Council	,, 5	1,074	1,223	+ 149	13½	17,339	+ 3,700
Ipswich Corporation	,, 5	803	924	+ 121	14	12,401	+ 2,328
Isle of Thanet	,, 2	334	1,460	+ 1,126	39½	21,962	+ 13,759
Kilmarnock Corporation	,, 5	240	279	+ 39	7½	2,141	+ 388
Lanarkshire	June 26	3,828	4,110	+ 282	25	84,350	— 3,876
Leeds City	July 5	14,195	16,606	+ 2,411	14	235,244	+ 64,905
Leicester Corporation	,, 5	4,652	5,658	+ 1,006	..	..	..
Leyton U.D. Council	,, 3	2,533	3,044	+ 511	14	44,165	+ 14,531
Liverpool Corporation	,, 5	19,886	23,091	+ 3,205	26½	575,645	+ 108,064
Llandudno & Colwyn Bay	May 16	367	523	+ 156	24	8,556	+ 1,878
London County Council	July 9	66,510	82,064	+ 15,554	14½	1,161,362	+ 274,812
Maidstone Corporation	,, 3	350	406	+ 56	13½	5,199	+ 1,422
Manchester Corporation	,, 5	24,236	30,265	+ 6,029	14	426,266	+ 78,331
Newcastle-on-Tyne Cor.	,, 5	8,814	8,739	— 75	14	134,066	+ 6,920
Northampton Cor.	,, 4	842	1,224	+ 382	14	17,855	+ 5,650
Nottingham Corporation	,, 3	6,022	6,862	+ 770	14	96,984	+ 17,993
Oldham Corporation	,, 6	3,341	4,308	+ 967	15	65,782	+ 14,034
Reading Corporation	June 29	1,312	1,569	+ 257	12½	19,328	+ 4,039
Rotherham Corporation	July 9	2,345	2,150	— 195	14½	32,647	+ 1,823
Sheffield Corporation	,, 6	13,407	16,480	+ 3,073	14½	250,204	+ 51,643
Southampton Cor.	,, 2	2,651	2,784	+ 133	13½	36,804	+ 3,070
Southend-on-Sea Cor.	,, 2	1,334	2,454	+ 1,120	14	27,412	+ 14,028
South Shields Cor.	June 14	1,129	1,467	+ 337	11	15,057	+ 3,121
Sunderland Corporation	July 6	1,994	2,829	+ 835	14	40,702	+ 11,518
Swindon Corporation	May 14	280	335	+ 55	6½	2,031	+ 160
Torquay Tramways	June 26	236	1,164	+ 228	25	23,349	+ 3,761
Tyneside Trys. & Trmrds.	,, 18	1,042	1,132	+ 90	25	23,539	+ 28
Wallasey Corporation	July 5	2,151	2,550	+ 399	13½	35,314	+ 9,986
Walsall Corporation	,, 5	1,181	1,314	+ 133	14	19,568	+ 2,674
Walthamstow U.D. Coun.	,, 5	1,658	1,577	— 81	14	25,111	+ 4,828
Warrington Corporation	June 26	726	851	+ 125	12	11,158	+ 1,962
West Ham Corporation	July 3	4,743	5,272	+ 529	13½	75,495	+ 17,693
Wolverhampton	,, 9	1,637	2,012	+ 375	14	29,040	+ 4,365

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	July 1	£52,347	£53,015	26	£1,422,569	— £10,736
Auckland (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,382
Ballarat and Bendigo (4 wks)	Apr. 27	4,095	4,291	4	4,291	+ 196
Brazilian Traction (Mirs.)	Apr.	8,330,000	9,208,000	17	35,032,000	+ 3,456,000
Brisbane	Apr.	35,530	38,775	17	151,110	+ 18,541
British Columbia $	May	486,876	628,847	47	6,650,954	+ 1,152,390
Buenos Aires Lacroze	June	38,375	61,356	52	512,859	+ 75,101
Burmah Tram. & Light Rs.	May 31	29,019	38,900	43	364,885	+ 96,111
Calcutta Rs.	June 28	73,286	85,791	25½	..	+ 285,262
Cape Town	May	..	23,405	..	..	..
Carthagena and Herrerias	June	5,047	8,373	26	16,791	— 10,841
Cordoba	Feb.	12,972	13,549	48	159,208	+ 11,492
East India	May	1,920	2,131	43	19,679	+ 5,472
Hong Kong $	May 24	13,782	14,300	21	297,180	+ 16,236
Kalgoorlie	Feb.	2,373	2,278	8	4,840	— 55
La Plata	May	5,105	5,702	22	29,352	+ 4,274
Lima	Ap..	48,557	49,968	17	92,631	+ 10,652
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	June 30	40,270	44,349	26	453,043	— 30,367
Manaos Rs.	Aug.	150,657	132,507	34	1,152,686	+ 83,959
Manila $	Apr.	163,500	212,488	17	863,383	+ 192,193
Montevideo	May	32,301	27,382	31	265,287	+ 26,943
Para	,,	24,925	24,503	26	147,430	+ 3,339
Pernambuco	June 29	4,204	5,351	25½	140,340	+ 23,022
Peruvian $	Feb.	925,410	943,470	34	7,973,835	— 229,195
Port Elizabeth	May	..	5,145	..	..	..
Rangoon	June	6,163	6,276	26	38,626	+ 927
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore $	May 31	13,541	13,865	22	339,771	+ 42,451
Toronto $	May	1,090,747	1,032,717	21	5,290,599	— 29,638
Winnipeg $	May	280,935	248,191	..	..	..

WANTED.

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THE Tramway & Railway World
WITH MOTOR TRAFFIC SECTION

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TELEPHONIC TRAFFIC CONTROL FOR TRAMWAYS.

THE EXAMPLE OF WEST HAM.

For the last few years several of the railway companies in this country have had in operation a system of traffic control, mainly applicable to the goods and mineral train services, which has proved of great advantage. Designed and manufactured by the Western Electric Company, the apparatus is of the telephone order. Essentially there is a central control station in telephonic touch with officials all over the system. The object in view and the object attained is the regulating and co-ordinating of traffic, so that delays may be minimised and the greatest amount of motion may be got out of the rolling stock. The control does not interfere with the signalling system, which in any given case is local; it is a guiding and directing power in regard to trains over a wide area. In the case of mishap and a blocked line, it is a help to rapid clearance and to resumption of traffic, and speeds up arrangements for diversion of trains and the minimising of delays.

Such a system is applicable to tramways with benefits at least as great. Where tracks run along crowded streets, where junctions and crossings are numerous, there lie the possibilities of serious delay to the cars. There is the ever-present chance of a car failing so that it blocks all its successors. Trouble may arise at points on curves through an over-energetic motorman. Even more likely is the breakdown of a horse-drawn or heavy motor vehicle on the tracks, stopping the tramway until it is removed. An "earth" may develop on a feeder, and a section be rendered dead. Various other things may happen, any of which may cause a stoppage of cars and the assembly of a row of them half a mile long or more. It is pre-eminently in the interest of the tramway authority

Fig. 1.—Traffic Controller in Telephonic Communication with the Central Control Station, West Ham Tramways.

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to minimise such stoppages, not merely from the point of view of revenue earning, but from that of the convenience of the public. In the ordinary way tramway undertakings are provided with telephones fitted here and there to the overhead wire poles or to the street section boxes from which a car conductor or inspector can call up the head office and inform it of trouble. Often there is delay before the trouble can be removed; no one is on the spot with ability to realise what should be done, nor, if he has the ability, with authority to order it to be done. Somebody in authority has to be sent to find out about the matter and to take steps accordingly.

The new method, adapted from railway practice, is different. The central office is the centre of a spider's web of communications with all important traffic points on the system. A controller presides at the centre, and he has district officers at every important traffic point. They may act as local traffic regulators as well, but they are never far away from their telephone. The controller can call them all up simultaneously, or he can call them individually. They can call him up on the spot. If a car is off the rails or otherwise stalled, the district man advises. If it seems well, he gets instructions to turn cars at the nearest cross-over on each side of the block, and to instruct passengers to walk past the obstruction to cars on the other side. If sudden demand for more cars arises on one route, it can be met at once through the telephone arrangements by diverting cars from less heavily loaded routes. Whatever emergency may arise, even if emergencies arise simultaneously on different routes, the central controller has his hand on the traffic organisation, and can devise ways and means for restoring mobility to the cars. In fact the whole system can be worked always as a co-ordinated whole, as if under an all-seeing eye.

The first tramway undertaking to adopt this system is that of the West Ham Corporation, though it is being followed by Southampton Corporation and others. While the system costs money to instal and to work—not so very much—two years' experience with it at West Ham shows that as much traffic revenue may be conserved in, say, a day as will more than pay the capital charges for, say, a year.

The system and the method of operation, as applied to West Ham and other tramways, may seem at first glance somewhat complicated, but it is, as a matter of fact, quite simple and easily maintained.

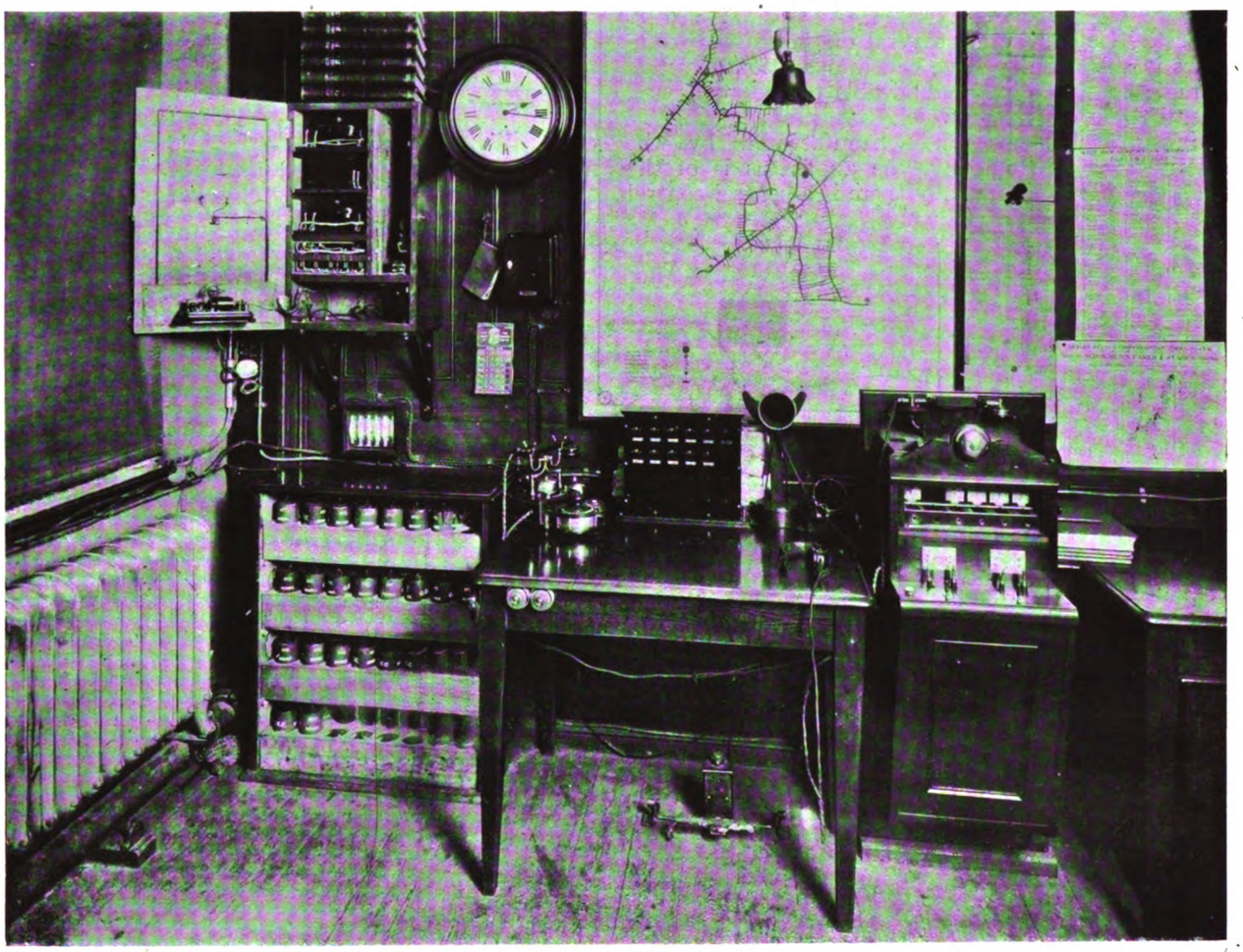

Fig. 2.—Central Control Station and Telephone Room at West Ham Tramway Offices.

The controller works from a control station—a room on the upper floor of the tramway offices (Fig. 2)—and is supplied with a telephone and a means of immediately ringing up the important traffic points on the lines under his control. At these various points (described as way stations), which are such places as car sheds, generating station, important junction points at which traffic regulators are stationed, etc., are fitted telephones and bells (Fig. 7). The controller has before him a map of the system (Fig. 6), on which every point where a way station is situated is marked. He has complete control of the traffic, and every accident, traffic block, etc., must be reported to him directly.

As he receives information from all points of the

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system, he is in a position to consider it as a whole, and to prevent a minor local trouble from dislocating traffic over the whole system, which is not uncommon when the local traffic regulators have to deal with the matter without knowing what is happening at a point a few streets away.

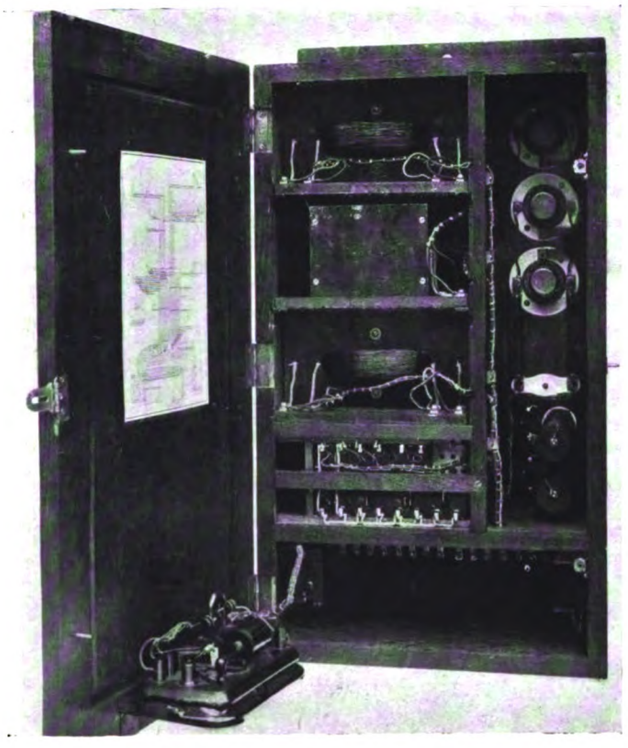

Fig. 3.—Selector Apparatus Case.

The method by which the controller gets in touch with the way stations and *vice versa* is very simple. He has in front of him a set of keys, one being associated with each way station. To call one of these points he gives the associated key a quarter turn and releases it. The bell of the way station required, and that bell only, then rings.

When a way station man requires to call the controller, he removes his receiver and listens to hear if the line is engaged. If not, and the controller is connected, he just speaks to him, but if the controller is not at his telephone the way station man turns his generator handle, and so rings up the controller. Calling either way can be effected in less than five seconds.

Way station men cannot call one another, and this is a decided advantage, as it means that the controller is in real control, and nothing unusual can happen without his knowledge. Another point of considerable importance is that the controller, by operating a "general key," can at one time call up every man on his line, and simultaneously give instructions to all.

The controller has in his office (Fig. 2) a telephone, a case of selector keys, a selector apparatus case (Fig. 3), batteries, an extension bell, and a bell and push communicating with the general manager. The selector key cabinet, which is seen on the table in the centre of Fig. 2, is fitted with as many selector keys as there are way stations under the control. Each of these keys (Figs. 4 and 5) consists of a simple clockwork mechanism, which when given a half turn and then released, returns to its normal position. During its return it rotates a toothed wheel, the teeth of which press against one spring of a pair of springs, so that the two springs are in contact when riding over the top of each tooth, and separate as they come opposite to the root of the tooth. These two springs are in series with a battery and relay, which latter operates in time with the impulses of current caused by the rotating toothed wheel. The contacts of the relay are connected to the line and a larger battery, so that impulses of current are sent out on to the line.

Normally the keys rest so that the contact springs are separated. The first tooth is much thicker than the remainder, so that while the spring is riding over this, current is flowing for some appreciable time. The remaining teeth are quite narrow, allowing only a momentary current to flow, and at the side of the toothed wheel is fitted a metal shield, the edge being on a level with the tops of the teeth. This shield can be adjusted to cover any number of teeth, so that any number of impulses can be sent out. Thus, on the key calling station No. 5, for instance, with the key normal, the contact springs are apart; on being operated, the springs first come in contact for an appreciable time then they break and make five times as they ride over five teeth, and then they remain in contact for a few seconds while they ride over the shield already mentioned, separating and remaining apart as the key comes to rest.

The relay responds exactly to these movements, and corresponding current impulses are sent out to the

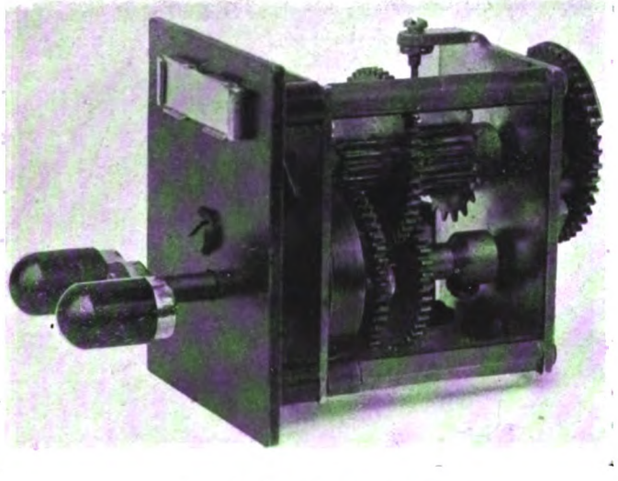

Fig. 4.—The Selector Key.

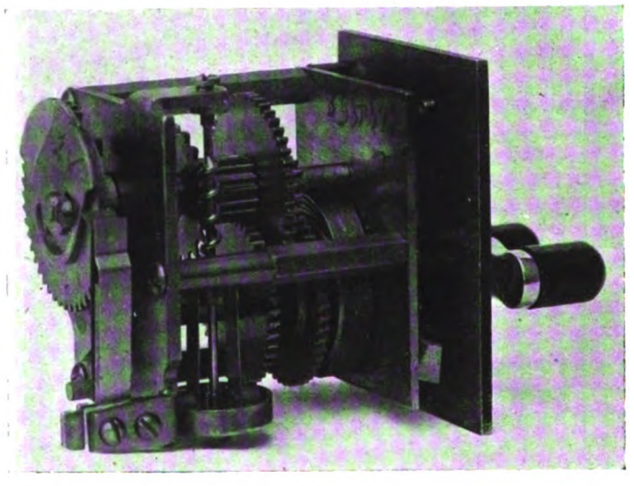

Fig. 5.—Another View of the Selector Key.

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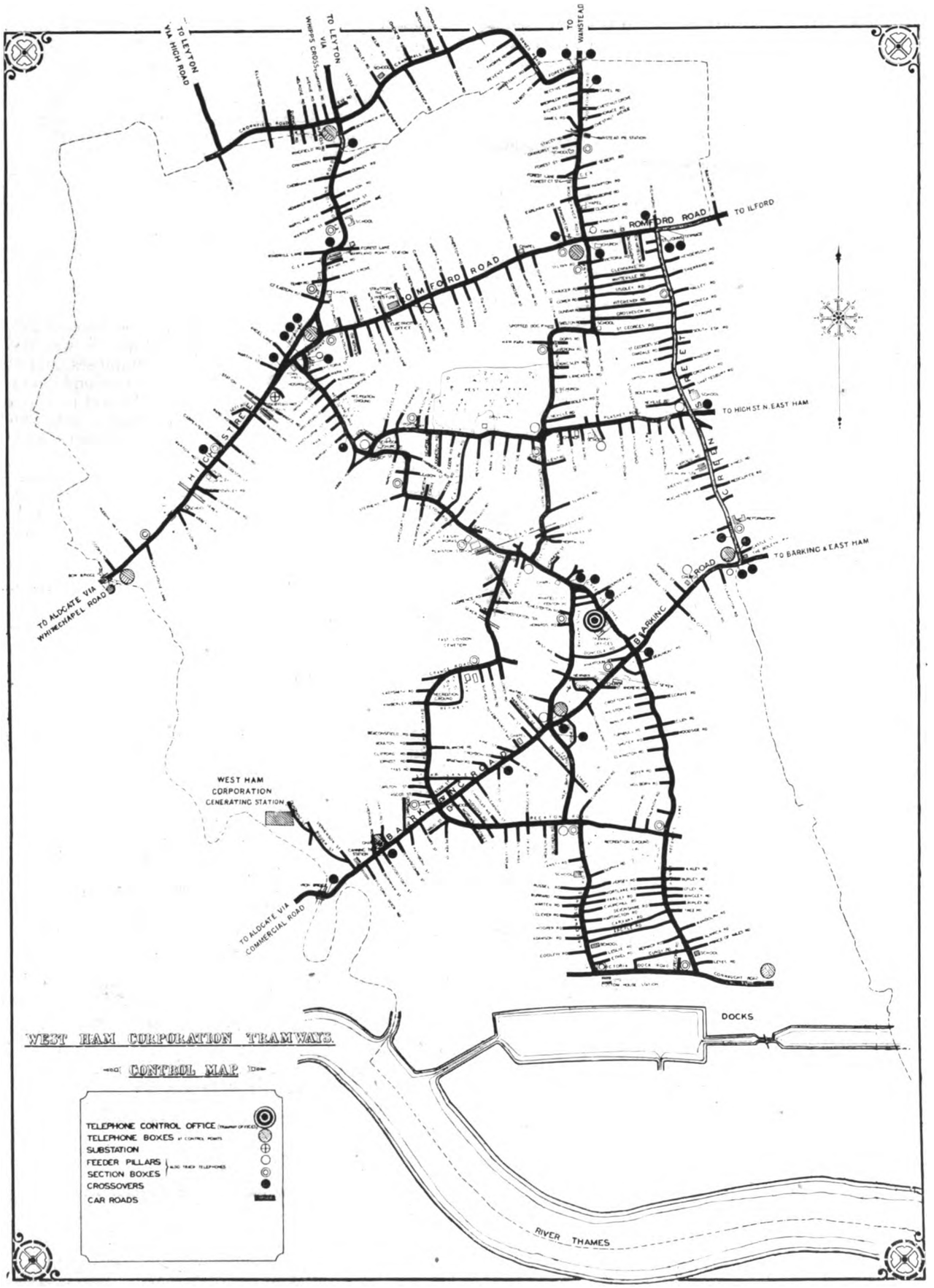

Fig. 6.—Map of West Ham Tramways, Showing Position of Telephone Boxes at Control Points.

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line. The whole movement of the selector keys takes about five seconds. In order to avoid unpleasant " clicks " in the telephone receiver, due to these current impulses, and that they may be received in a suitable form to operate the apparatus at the way stations, certain retardation coils and condensers are provided.

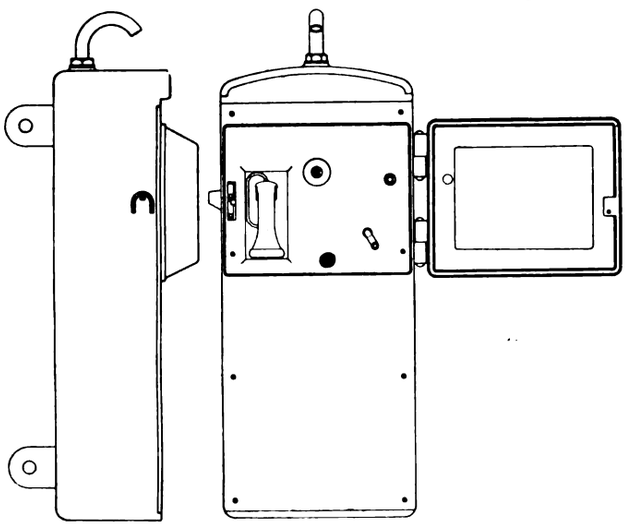

Fig. 7.—Telephone Box at Control Point.

At each way station there is a box containing a telephone, a selector set, a magneto generator, necessary protective apparatus, a loud ringing battery bell and batteries. The telephone is bridged across the telephone line.

The selector, consisting essentially of two electro-magnets each operating an armature, is the chief feature of the system, and calls for some description. Each armature operates a lever and pawl, which in turn rotates a toothed wheel fitted with a contact. The toothed wheel is fitted with a light spring, which returns it to a set position as soon as it is free from the levers mentioned. One of the electro-magnets is slow acting, and does not respond to the current impulses, but simply pulls up and remains pulled up so long as impulses are being sent along the line. This holds the toothed wheel so that it can be rotated in one direction but cannot return until the armature of the slow-acting magnet falls back, i.e., until the current impulses have ceased. The quick-acting magnet responds to the impulses, and its lever pushes the toothed wheel forward one tooth per impulse. The contact can be set to close a local bell circuit after any number of impulses ; thus on the 5th station the wheel is stepped forward five teeth, i.e., 5 impulses, by the controller's selector key, and then comes to rest for a few seconds with the contacts closed and the bell ringing. When the selector key has finished rotating the current ceases, the slow-acting magnet armature falls back, and the toothed wheel returns to its normal position.

Only one way station bell will ring, because on every other station, when the selector stops, it will have received either too few or too many impulses, and the contacts will not be closed. There is a second contact which comes into operation when the wheel is stepped completely round, so that by operating a key which will step every selector right round, the controller can call every station at the same time.

As showing the reliability of the selector, a sample selector was set operating continuously for several months, and when examined after over one million and a quarter calls had been dealt with it showed no appreciable signs of wear.

As the way stations are frequently situated in the open on island refuges—a typical instance is illustrated in Fig. 1—or on the sidewalk, a special cast-iron box containing all the apparatus except the bell has been designed. With this it is necessary for the traffic regulator, or whoever is using the apparatus, to open a small door which discloses the transmitter, receiver, and generator handle. For repairs, etc., the main door can be opened, making all the apparatus available. The cast-iron box is weather-proof and dust-proof.

The battery bell usually consists of a special iron-

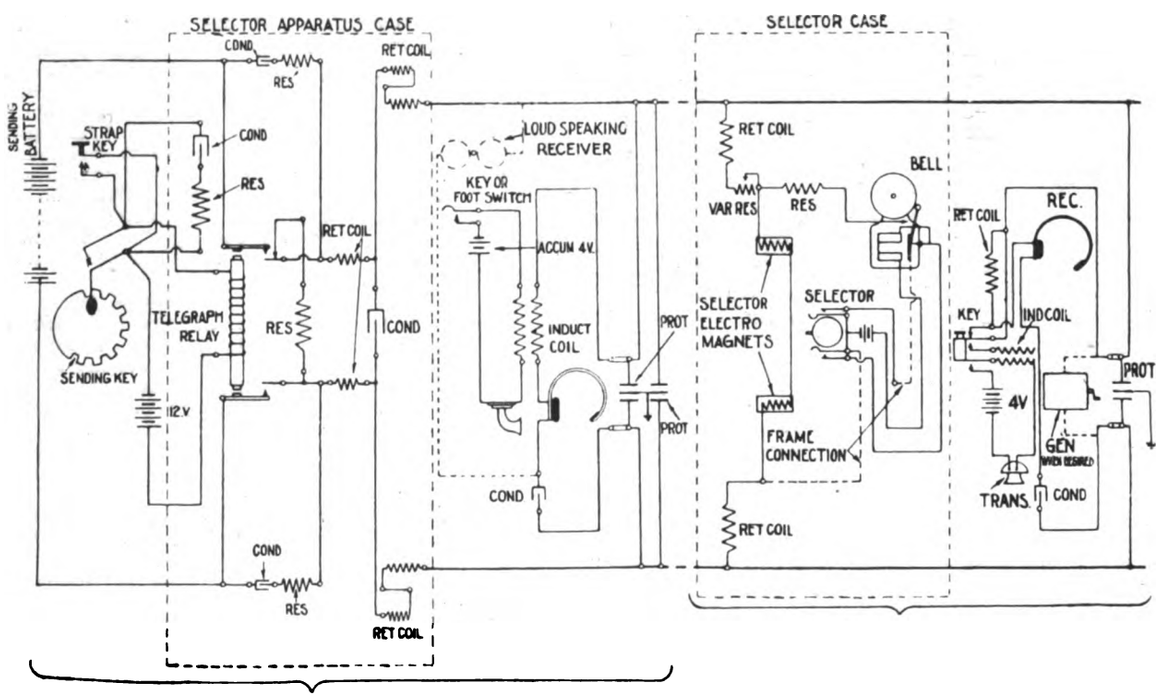

Fig. 8.—Tramway Control System—Diagram of Connections.

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cased weather-proof bell with a 10-in. gong, giving a very loud, clear ring, which can be heard for a considerable distance, the tone being very distinctive and different from any fire or other bells which may be in the neighbourhood. In cases where the apparatus can be placed in a building or hut, separate apparatus as used on railways is employed. In this case the telephone consists of a small wall pattern instrument with fixed solid back transmitter and bell receiver, the necessary induction coil, etc., being contained in the box.

The telephone protective apparatus gives ample protection against the effects of contacts with the trolley wires, etc. It includes a double-pole switch by which the apparatus can be completely isolated.

It will be noted that with this system only one pair of wires looping up the various points is required. The system is very flexible, extra stations being added as required without any change to the existing scheme. The number of stations which can be called individually is 78, which is far in excess of practical requirements. The telephone circuit employed has been specially designed to give very clear speech over any length of line which can possibly be met with in practice. The selector, on which the system so largely depends, is the result of many years of experimental work and many tests.

Recently the Western Electric Company have brought out a modification of the control system, using alternating current for selection. The source of supply, however, remains an ordinary primary battery. The principal points of difference between the two systems are :—

(1) The direct-current system, in its simplest form, allows of 48 stations per line being fitted, while the alternating-current system allows of 78. Even with this increased loading the transmission losses are much lower with the new apparatus than with the direct-current apparatus.

(2) The newer system places a much smaller drain on the sending battery, which, in consequence, has a considerably longer life.

(3) With the direct-current apparatus the keys send out impulses of current in one direction only, whereas with the alternating-current apparatus the impulses are alternatively positive and negative, the selector responding to both, and this reduces the time taken for a call, as there is no wasted period between the impulses.

(4) The apparatus as a whole has been made more robust, and operates within wider limits, so that the possibility of failure, which is very small in the direct-current system, is almost non-existent in the alternating-current system.

(5) The new selector is unaffected by induced currents, ordinary alternating currents or ordinary magneto-ringing currents.

The advantages arising from the use of such a system must be obvious to the tramway traffic expert, but a few may be indicated for the benefit of those who are interested in tramways but are not practical traffic men.

In the first place the best results can be obtained from the car mileage available, as blocks can be avoided and cars kept properly spaced. The very complete information which can be logged makes analysis and re-arrangement of the car mileage a simple matter. In the case of minor troubles a report can be obtained immediately, and the trouble cleared in the most expeditious manner.

With more serious troubles a breakdown gang and car can be hurried to the spot, knowing exactly the trouble to be met, and in the case of a second fault on another part of the system the gang can be sent to deal with this trouble without any delay. Routes can, in an emergency, be easily re-arranged so as to keep the cars running while local repairs are in progress.

To meet specially heavy loads, such as are occasioned by football matches, processions, etc., extra cars can be hurried out just when and as required. The system in itself is an excellent time regulator, as the controller can ring up all his men at a definite time each day, and have all watches and clocks set to his time. Accidents can be reported immediately, and full information obtained on the spot from the men directly affected. It is one of the great advantages of the control system that it enables the fullest records to be kept of all occurrences throughout the system. The log kept by the controller provides a detailed record, hour by hour, of every fact reported to him from the various control points, and from this is compiled a "daily traffic report "which is placed on the manager's table each morning. The importance of this first-hand record will be readily understood by every manager. By the courtesy of Mr. Lewis Slattery, general manager of West Ham Corporation Tramways, we append a transcript of a part of the daily report of June 4. Each item was, of course, available at the time the occurrence recorded took place, and any action required could at once be taken :—

WEST HAM CORPORATION TRAMWAYS.

DAILY TRAFFIC REPORT.

WEDNESDAY, JUNE 4, 1919.

4.50 a.m.—5.21 a.m.—Current failed on Romford Road, Leytonstone Road, and High Street feeders.

CAUSE.—Defective London County Council car 1153.

LOCALITY OF DELAY.—Bow Bridge to Green Street and Lingfield Road.

SERVICES AFFECTED.—5, 6, 7, 8, 61, and 63.

CARS PROCEEDING TO—Stratford, Canning Town, Wanstead Flats, Docks, Bakers' Arms, Aldgate, Leytonstone, Ilford.

HOW DEALT WITH.—Arriving on duty at 5 a.m., Inspector Clark reported "Current failed at 4.50 a.m. I have been to sub-station to ascertain cause; sub-station reports no trouble here." Wagon despatched from shed to Stratford. Inspectors Clark, Lawrence, and Wood despatched to inspect lines. The lines reported O.K. The sub-station informed, and instructed to feed until countermanded. Inspector Lawrence to put L.C.C. 1153 in tow for depot. L.C.C. informed by national telephone. Services 5 and 63 turned at Green Street for Canning Town and Ilford. Services 6 and 7 turned at Victoria Street for Canning Town and Docks. One service 8 turned at Adamson Road. On returning, Mr. Somerville informed by Smith.

DELAY.—Thirty-one minutes on one section only.

9.30 a.m.—A breakdown occurred opposite "The Harrow," High Street, Stratford, on the down track. A four-wheeled fish lorry, loaded with fish, owned by Messrs. Blayney and Son, Fishmongers, The White City Fish Shop, Stratford, and in charge of H. Chivers of the same address, the cause of breakdown being due to the off-side front wheel being drawn from the box.

Only a slight delay to traffic. Track in good condition. No complaint made. No police officer present. Mr. Somerville informed, also Claims Department.

10.5 a.m.—A breakdown occurred opposite the Cash Office, Stratford, of a motor and trailer M 6950, owned by Thos. Feast, Cartage Contractor, Silvertown, in charge of George Lester, 22, Malmesbury Road, Canning Town. The breakdown was due to the collapse of the off-side hind wheel, in bad condition, sample obtained. Trailer loaded with 22 sacks of flour, weighing 2 tons, 15 cwts. Track in good condition, no complaint made. Particulars taken by P.C. 226 K. No delay to traffic. Mr. Somerville and Claims Department informed.

1.35 p.m.—Regulator Young at Plaistow Building reported an accident alleged to have occurred to a Mrs. Emma Eiles, 93, Harcourt Road, West Ham, who complained that she had fallen from a car at Clegg Street, Plaistow, about 12.34 p.m. She has since been to "The Stores." She at first refused medical aid, but afterwards said she would like to see a doctor. She was taken to Dr. Kennedy, Balaam Street, who stated there was no sign of any injury. The car she alleges she fell from is car 53, Service 7, Driver Ellis, Conductor Miller. The conductor denies all knowledge of the accident.

WITHERINGTON.

(Signed) T. SOMERVILLE, Traffic Superintendent.

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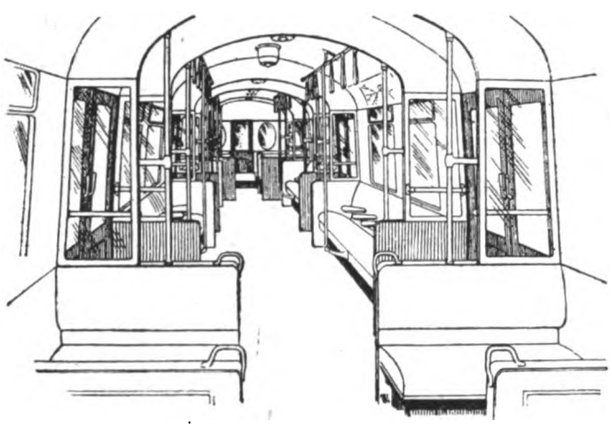
NEW CARS FOR THE DISTRICT RAILWAY.

The Underground Railway authorities are giving very earnest attention to the question of additional and improved rolling stock for their railways, and have now under construction a new type of car which will go a long way to remedying the present complaints as regards overcrowding and lack of comfort. The present needs of the District Railway alone are for 100 cars which will be put into service directly they are delivered. Already the number of vehicles worked over the tunnel section of the railway exceeds that of any other line in this country, and as it is not practicable to increase the number of trains except to a small



Sketch of Interior of New Car.

degree, the alternative adopted is to increase the length of each train to 400 ft. This is the maximum length permitted by the station platforms.

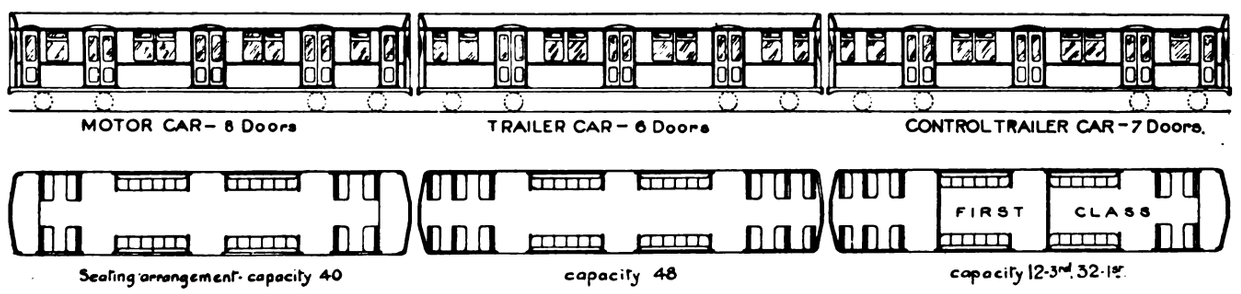
The new District trains will be composed of eight cars in all. The cars will be wider—the width being extended to about the limit of the present step-board—and the trailer cars will be fitted with three double sliding doors, each wide enough for two passengers to enter or leave the car at one time. On the motor cars and control trailer cars, in addition to the three double doors, single doors are fitted at the ends of the cars which will be available for the use of passengers when not occupied by the train staff. It is interesting to note in this connection that the arrangements made on an eight-car train give the equivalent of 52 single doors for the use of passengers entering or leaving the train. The provision of these facilities should materially reduce the time taken in loading and unloading at stations, and enable a greater number of trains to pass over the congested sections of the line during rush hours. The present type of end vestibule will be dispensed with in the new design, and the car doors so arranged that they are equally spaced along the side of the coach. This will mean that, no matter in what part of a car a passenger is seated, he will have a door conveniently accessible.

In appearance the new stock will not differ very materially from the latest pattern District trains now running, except that the sides of the coaches will be slightly curved instead of straight. Improved springing will be fixed and the cars will be fitted with larger bogies and wheels and be higher powered, which will materially improve the running as regards speed and comfort.

The dimensions will be 9 ft. 6 in. wide, compared with 8 ft. 6 in.—the present car—and the length 50 ft., against 49 ft. The new trains will be capable of speeds up to 45 miles per hour when working "non-stop" services. The improved acceleration has been brought about by putting additional motors on the trains, and its effect will be to permit of an increased number of trains being passed through the tunnels. Improved braking equipment has been adopted in order to secure more rapid, yet easy, stopping, as the problem of getting more trains through the tunnel sections depends not only upon the time taken between stations, or absorbed by station stops, but upon the period taken in starting and stopping.

The new eight-car set is made up of two self-contained components with a view to operating a five-car train during the slack hours and an eight-car train during the rush hours. The three-car portion can be utilised during slack hours on certain local sections of the line.

As regards the interior arrangements and decorations, special attention has been paid to the design of the seats, and greater gangway room has been afforded in order that the maximum amount of comfort may be obtained by travellers. The upholstery will be in moquette velvet in non-smoking compartments, and in "smokers" of a washable leather or some such material as "pegamoid." At each end of the car there will be large oval plate-glass windows, which will give a very artistic appearance and finish to the car. The interior metal fittings and door handles will be of a non-oxidising material. Improved ventilation is being fitted which is designed to suit the difficult conditions of a train running both in tunnels and in the open. Convenient handrails and vertical pillars will be provided at points next doorways and at open spaces. The stock is constructed of steel throughout, except for a small amount of woodwork, which is chemically treated in order to make it fireproof.



Elevation and Plan of New Cars for the District Railway.

Electric Railways for Jamaica.—A correspondent of the *Morning Post* at Kingston has stated that the Government of Jamaica are arranging to have a survey made of the water power of the large rivers, to see if the electrification of the railways is feasible. The heavy cost of coal and the necessity of considerable railway extension makes the proposed change desirable. A local agent of the Westinghouse Company of Pittsburgh is reported to be collecting data on which the Westinghouse Company might tender for the construction of electric railways.

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DROP IN VOLTS FOR TRACK OR STEEL CONDUCTORS.

By E. GOOLDING.

In the designing and layout for traction schemes it is necessary to discover what loss is due to the use of track rails as a return conductor, and what loss is incurred when steel conductors are used. To attain this an amount of investigation is necessary, and when varying conditions prevail on a series of converging lines, a considerable amount of separate calculations are involved in order to summarise the loss at some remote point. It often happens that the real values of those items on which the losses depend can only be estimated, and an assumed value put to the respective items.

In dealing with an existing tramway or railway system, it is rather difficult to find out exactly and to what extent the track rails have been worn, and this wear on a large system cannot in the natural course of things be uniform throughout, and therefore an estimate must be made as to what average percentage must be allowed for the loss in area due to wear. This reduction of area is, of course, a vital matter, since it directly influences conductivity. Another point that has to be left more or less to individual ideas is the reduced efficiency of the bonding. It is erroneous to assume that bonding at joints can be ignored, and the rails taken as one continuous length ; this can only be done on a few conductor rails, where the bonding is of an equivalent area to the rail. Usually the track rails are bonded at joints with an area of copper equal to one-fourth the area of the rails, and this means the introduction of a total length of copper of about 150 yards per mile of rail. Therefore to realise the total drop on a line due value must be given to the resistance that actually exists in practice. Another item that can only be estimated is the load either as a maximum or an average, and this again depends on the method of distribution, and whether the cars are assumed to be running normally or if a number are taken as accelerating. In this connection due value must be given to their location and the starting current, more especially when several cars start simultaneously. It is usual to take the average current consumption per car on a tramway, but in the case of electric trains it is somewhat different, there being fewer cars, and each taking very heavy starting currents, with possibly several accelerating at the same time on the same sections.

For working out the drop in volts on various systems, Table No. 1 was prepared to obtain a rapid method of ascertaining the drop under a large range of conditions. It will be observed that, knowing the weight of rail ratio of resistance, or failing that the resistance

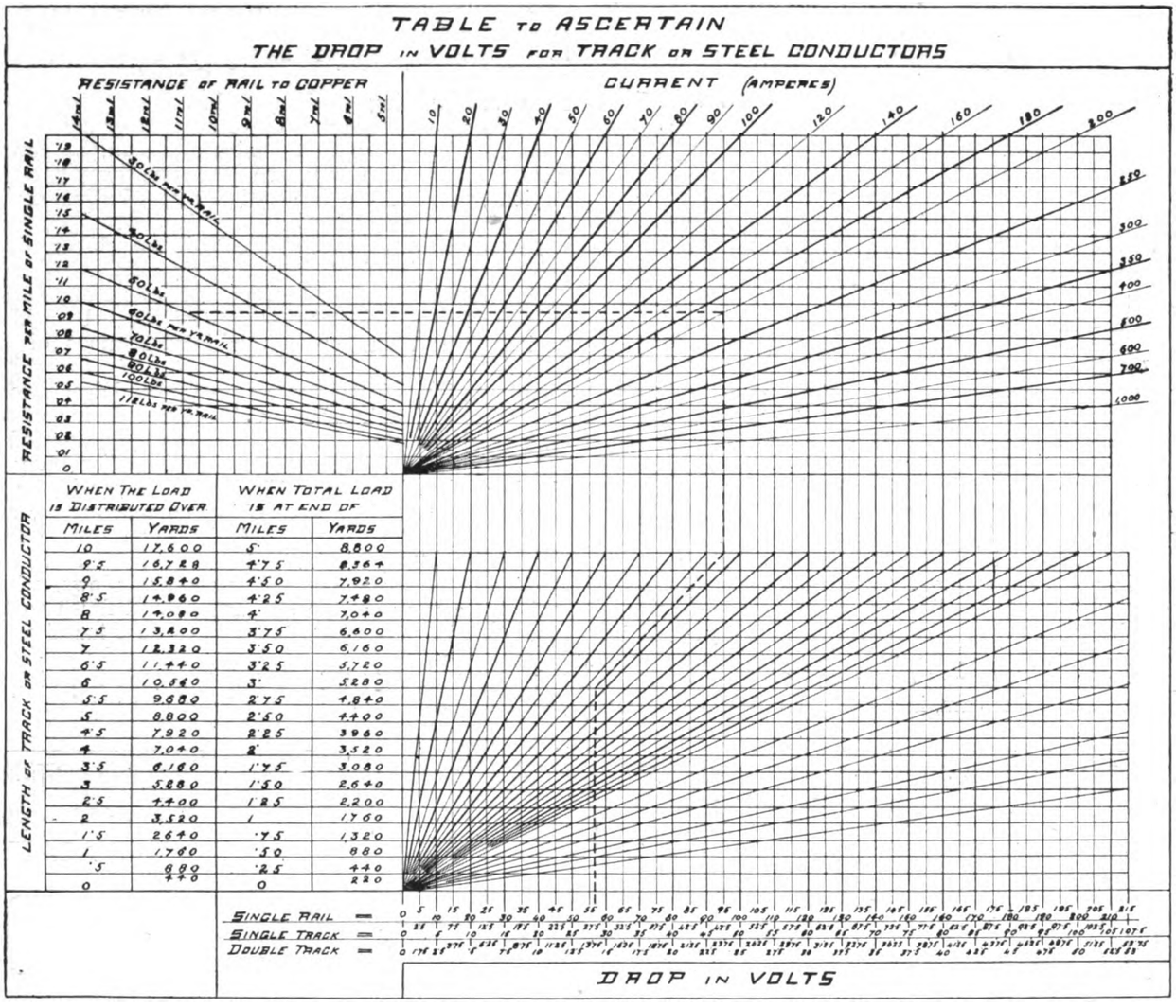
TABLE TO ASCERTAIN
THE DROP IN VOLTS FOR TRACK OR STEEL CONDUCTORS
RESISTANCE OF RAIL TO COPPER
CURRENT (AMPERES)
RESISTANCE PER MILE OF SINGLE RAIL
LENGTH OF TRACK OR STEEL CONDUCTOR
WHEN THE LOAD IS DISTRIBUTED OVER
WHEN TOTAL LOAD IS AT END OF
MILES
YARDS
SINGLE RAIL =
SINGLE TRACK =
DOUBLE TRACK =
DROP IN VOLTS

Table 1.

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per mile of the rail, the current taken, and the length of line; also if the load is distributed or located at the further end of the line, then the drop can be found for a single rail, single or double track.

REQUIRED DROP IN SINGLE TRACK AT THE END OF A LINE.

The dotted line gives a case where conditions are :—

1. Weight of rail per Vd., 50 lb.
2. Ratio of resistance, 10·75 to 1 of copper.
3. Current taken by all cars = 200 amperes.
4. Length of line, 6 miles.
5. Distributed load on single track.

Answer—Drop in volts at end of line = 28·5 volts.

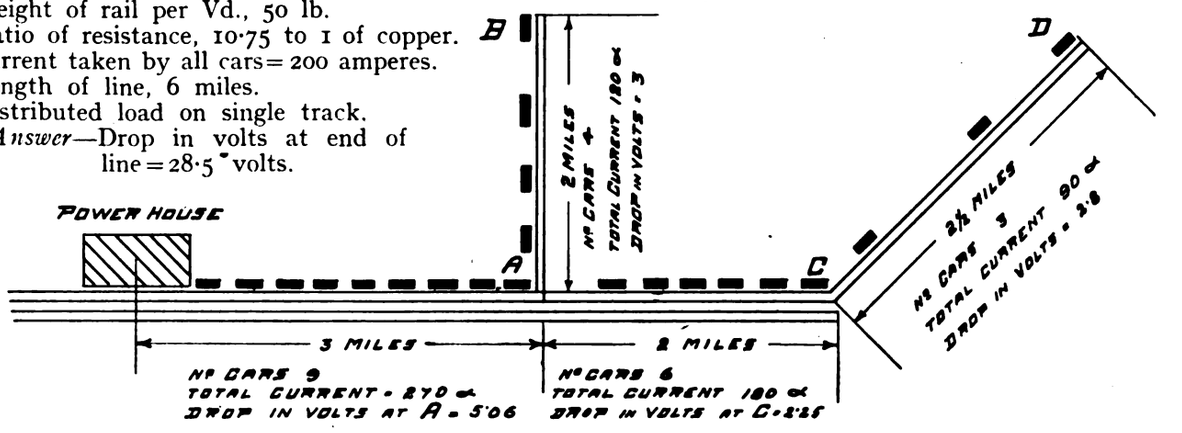

Fig. 1.—Drop in Volts on Each Section due to Local Cars only.

To obtain the above answer by use of Table 1 we take the given particulars one by one as represented by the dotted line, starting at a point where the 50 lb. rail line intersects the ratio line of 10·75, then horizontally to the point where the line touches the 200 amperes diagonal. From this point we drop to the top line of lengths, and follow diagonally as shown until we arrive at the 6 mile line for distributed loads. We then have to drop vertically to the table of drop in volts, and opposite the single rail we obtain about 56 volts drop, and opposite the single track line we obtain 28·5, which is the result required.

A proof of this is shown as follows :—

Drop in volts for the above conditions No. 1 to 5,

$$= \frac{\text{Res. per mile} \times \text{current} \times \text{miles length}}{\text{No. of rails} \times 2 \text{ for dis-load}}$$

$$= \frac{\cdot 095 \times 200 \times 6}{2 \times 2} = 28{\cdot}5 \text{ volts.}$$

It may be of interest to consider a typical case of a tramway system where it is desired to find under normal working conditions what voltage drop may be expected under the following conditions :—

Rails, 100 lb. per Vd.
Cars taking 30 amps. each.
Load distributed.

The number of cars and lengths of route and tracks are here shown on Figs. 1 and 2 in order to simplify the conditions to be dealt with. On each section of track data is given, and the drop on each of the sections due to the cars, length of line, etc., can be readily obtained from Table No. 1.

The total or actual drop on any route is influenced by the converging lines, since the current to the outlying sections has also to return, and uses the same rails, and accordingly increases the drop. Below in the Figs. 1 and 2 a summary of the losses is given from the various points shown as obtained by the use of the table.

Another useful method is shown in Fig. 3, and as an instance the route from the power-house to point D is taken, and acts as a check on the method shown on the two previous diagrams. The table of drop in volts is dispensed with in this latter case, but it will be readily seen that to deal with a number of diverging routes in this manner would become rather complicated,

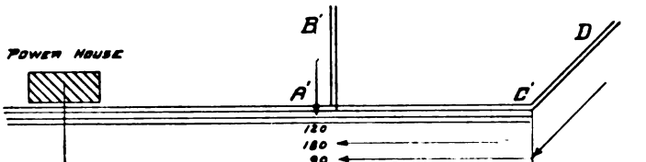

Fig. 2.—Drop in Volts due to Supply for Branch Lines.

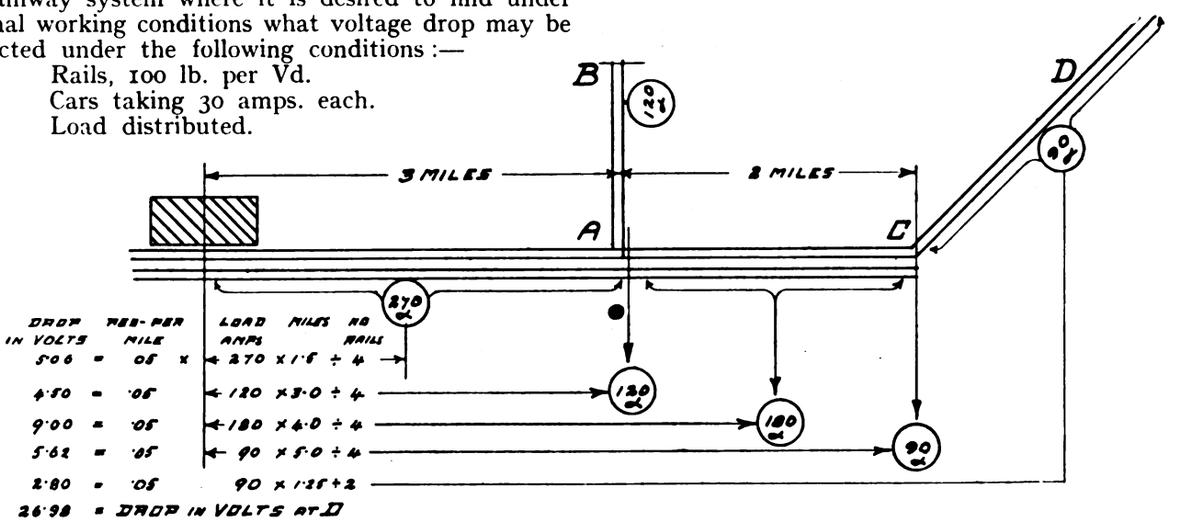

Fig. 3.—Alternative Method of Finding Drop in Volts at Points D.

The number of cars and lengths of route and tracks are here shown on Figs. 1 and 2 in order to simplify the conditions to be dealt with. On each section of track data is given, and the drop on each and by the use of the Table No. 1 a mass of figuring which would otherwise be involved is obviated.

It must be remembered that so far no allowance has been made for the loss in rails due to wear, or for loss

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in bonding, and in this connection it may be briefly stated that the average wear observable should be allowed for and deducted in direct proportion from the original weight or section, and a corresponding allowance made either on the table or in the calculation. With regard to the question of bonding, the ruling features are :—

Type of bond.
Area of contact at terminal.
Length of bond.
Ratio of conducting area to that of the rail.
Number of joints per mile.

Table No. 2 gives a near percentage of the resistance that should be added to the calculated rail resistance, and although this percentage is open to variation due to special conditions that may prevail, it gives a close indication or basis to work upon, and assists in arriving at a near approximation.

The main point is that, failing an actual test of the rail, which is not always possible, it is necessary to make a close estimate from the data available, and to do this the many items influencing the resistance must be embodied. In the layout of tramway systems the track losses that are permissible are restricted by the Board of Trade, and it becomes necessary to arrange

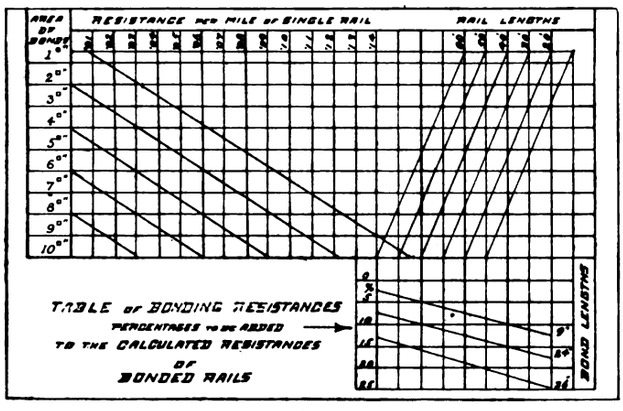

Table II.

sub-stations and negative feeders so as to keep within the limits stipulated. The difference of potential between the points furthest from and nearest to the generating station must not exceed 7 volts, and the current density is not to exceed 9 amperes per square inch of rail area. These regulations were instituted to avoid electrolytic action, which might otherwise take place in adjacent pipes should a greater potential difference exist.

With the increase of traffic that is often experienced comes an increase in current and a corresponding rise in the potential difference. To meet this condition and reduce the drop, negative boosters or negative feeders are installed, so as to relieve the track of a portion of the return current and so reduce the drop. Negative boosters are not a desirable asset, and the alternative method of running negative feeders to some point distant from the power-house, breaking the direct connection from the track to the negative bus-bars, and so compelling all return current to go through the negative feeders, will often have the desired result, and avoid the use of boosters and their attendant drawbacks.

Take, for instance, a track two miles long, one end of which is directly connected to the bus-bars, and the drop in potential difference at the furthest point is 10 volts. Now if the track connection to the power-house is broken, and a negative feeder laid and connected midway, that is one mile from the power-house, the return current has only to traverse the track one mile to the negative connection, and correspondingly the current absorbed by the cars on one mile is only half. We therefore halve the distance and halve the current, which gives quarter the drop, or 2·5 volts, against 10 volts previously. It may not be deemed expedient or advisable to run to a midway position, and only necessary to reduce the existing drop by a small amount, and to do this the desired point for making a negative connection to the track to give a desired drop can be readily found by reference to Table 1, thus eliminating the necessity for calculations.

THE COUPLED CARS OF NEWCASTLE.

In our issue of April 13, 1916, there appeared an illustrated description of an arrangement of coupled motor tramcars which had been introduced by Mr. Ernest Hatton, the engineer and general manager of Newcastle-on-Tyne Corporation Tramways, in the beginning of the previous winter. Owing to war conditions it had been impossible to build trailers. For the same reason the demands of the workmen's traffic were becoming more and more overwhelming. On account of the war also there was a shortage of drivers and conductors. To help to meet the conditions Mr. Hatton designed an arrangement for coupling and running together two motor cars. In this way, just as if a trailer was used, only one driver was required for the two cars, and at the same time there was more seating accommodation than would be normally provided in a tractor and trailer. All possible accommodation was indeed much needed, as the heavy workmen's traffic is largely concentrated on the route which runs along the riverside serving the numerous works close to the water face. The route is fairly level, the maximum gradient being about 1 in 20. The coupling employed was a rigid bar spring connected to each car platform. Single-truck cars were employed, and it was found in practice that they could keep up to the schedule time of heavy bogie cars with four-motor equipment running on the same routes, although the coupled cars have only one motor each. Another advantage which became very apparent was that, unlike the case of trailers, no shunting is required at termini.

The coupled cars having proved a great success, a reconstructed type has now been put into service in Newcastle, and a specimen of the unit is shown in the accompanying illustrations. Each car has only one motor, on the outer axle in each case, the motors on the inner axles having been dismounted. The controllers on the inner platforms were also dismounted, and the unit has only one trolley. There are thus two controllers only, namely, one at each end of the coupled unit. The power cables of the cars had of course to be remodelled. The cables between the cars are passed through tubes attached to the draw bar which is hinged and spring-connected under the platform of each car. The cars are also equipped with telescopic side gates to provide the necessary free action in rounding curves and to prevent people passing between the two cars. One motorman is employed and two conductors.

The brake system of these units is a special feature, and consists of a train type B.T.H. compressor with air reservoir and operating cylinder on each car. When the brake is applied, the air cylinder brings into operation through suitable mechanism the brake shoes on the wheels, and simultaneously the track brake. The

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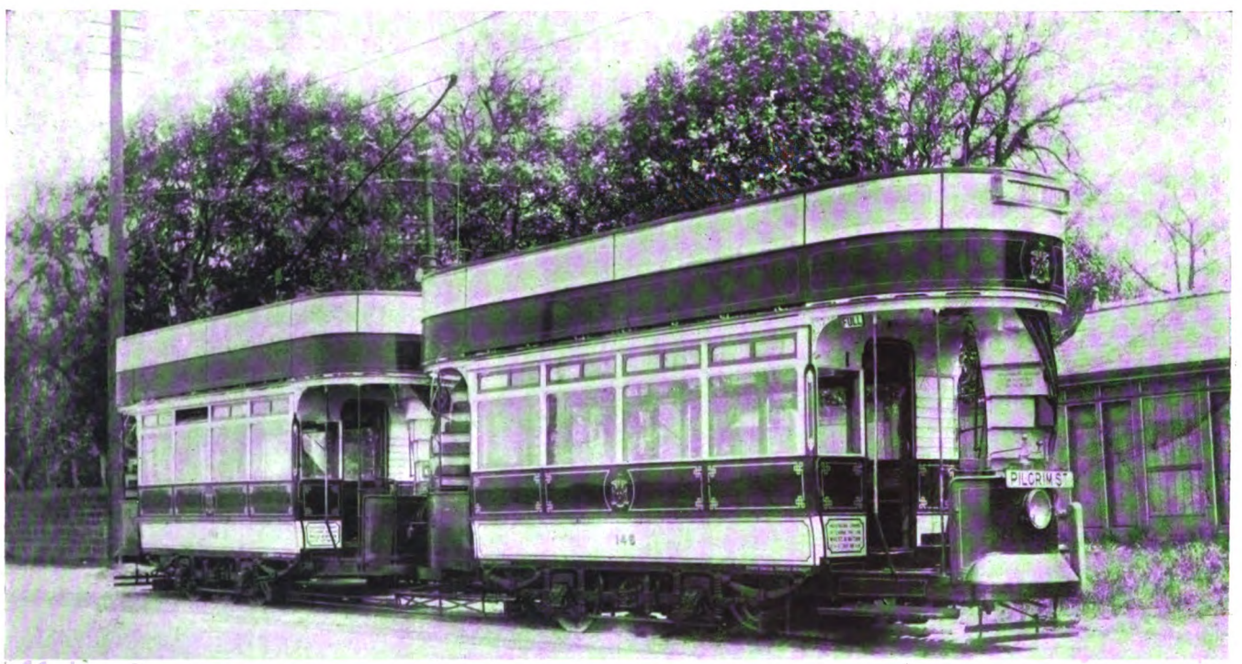
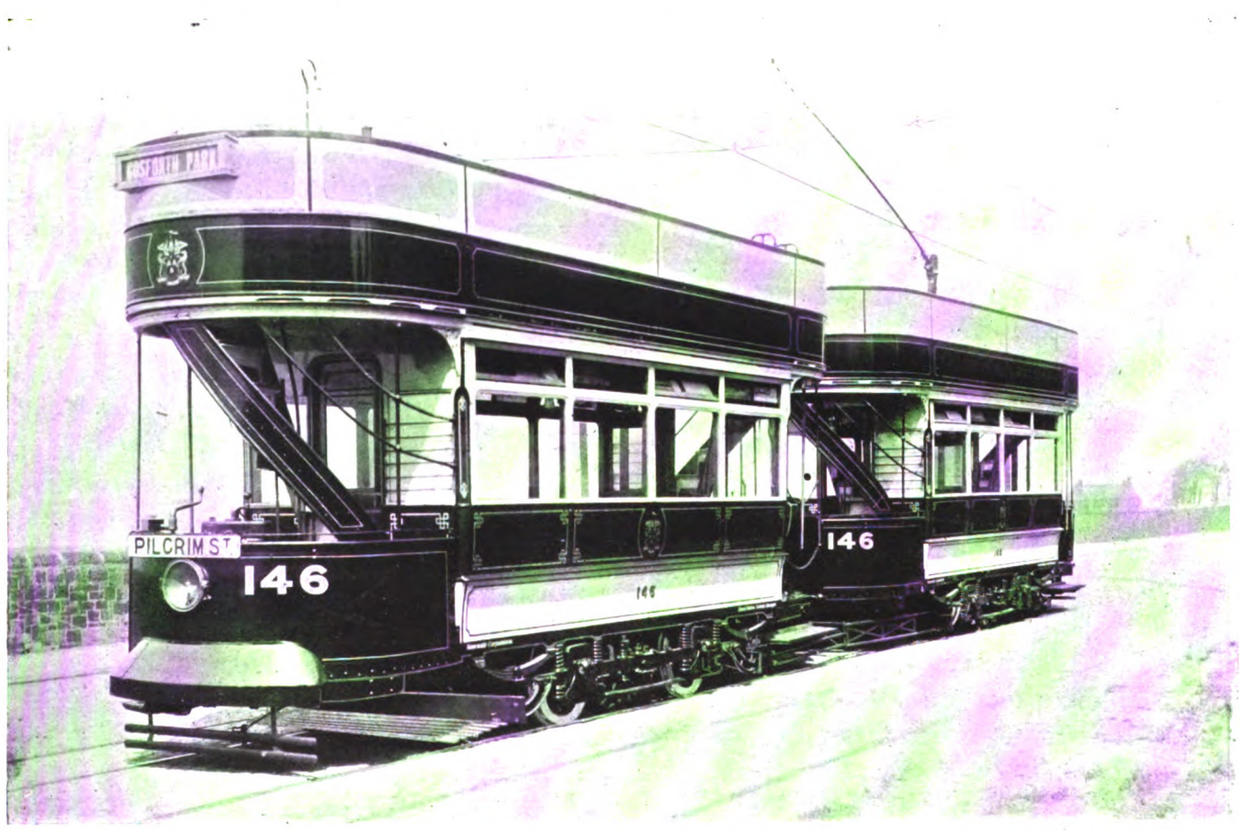


Newcastle Corporation have made considerable experiments with this method of braking on all types of their rolling stock, including four-wheeled cars and double-truck cars, during the last four years with remarkable success.

There is a saving in wheel brake shoes of over 30 per cent., and a considerable saving on tire wear due to the combination system of braking. The track brake mechanism is of the Peckham Truck and Engineering Company's make, and is exceedingly powerful in its action. We understand several other Corporations have been investigating this method of braking with a view to its adoption.

The General Manager of the Newcastle Corporation Tramways is satisfied that had cars been controlled in this manner prior to the war there would have been no difficulty whatever in training women to drive even the largest cars working on difficult routes, as the amount of physical energy demanded of the driver is so enormously reduced.



Coupled Cars—Newcastle Corporation Tramways.

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THE EDITOR will be glad to consider articles by experts. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, JULY 17, 1919.

Where Lies the Fault?

During the past ten years, London County Council Tramways Department has been the object of severe criticism. It has been described in unflattering terms times without number, sometimes unjustly, but often with reason, and the friends of municipal tramway enterprise have been forced to confess that the greatest opportunity of demonstrating the practical advantages of their principles has somehow been missed. Such an admission does not imply that the L.C.C. tramways have not attained a high standard of efficiency and service, for in mileage run, in number of passengers carried, in rates of fares, and regularity of service, the system compares favourably with many other undertakings, both municipal and company, which are regarded with complacency. Still, the present position of London tramways is disappointing to everyone—to the management no less than the public, and it may be useful to enquire for a little into the main causes of this comparative failure. Giving evidence before the Select Committee of the House of Commons appointed to enquire into London traffic conditions, Mr. Hume, ex-chairman of the Highways Committee of London County Council, showed that the construction of no less than 105 miles of tramway lines necessary to the completion of the system, had been prevented by the veto vested in local authorities, frontagers, and others, by Standing Order 22. Again, in his evidence before the Select Committee, Mr. A. L. C. Fell, general manager of the L.C.C. tramways, said that one of the handicaps of the tramways system was that it had never been designed as a whole; there were 14 dead ends in the central portions of London. It is wholly unnecessary to point out the great significance of those two statements. One realises, almost with a gasp of astonishment, that it is possible for a great tramway system to be stopped up at the most densely crowded of its traffic centres, that where the traffic should be swiftest and freest, there it is suddenly cut out. But that is the stark rock of offence round which London tramway traffic must be steered with the very least cost and friction possible. Indeed, the ingenuity, patience and good temper of the operators at those dead ends, combined with the good-humoured tolerance of the passengers, exhibit nightly a triumph of the human mind over difficulties which else might provoke riot and bloodshed. On the economic side, which is the more important from the general point of view, these dead ends appear disastrously inimical to economy. The loss of time, futile expenditure of power, and the cost in labour otherwise unnecessary runs up a bill of high figures which must be met, and with no corresponding income to balance it. Mr. Hume's evidence relates not only to the traffic facilities hindered and the reduction of the earning capacity of the system, but it also bears upon the capital cost of the undertaking as a whole. Parliamentary Bills, as everyone knows, are not prepared for nothing. Surveys have to be made, schedules prepared, notices in due form served, correspondence carried on, and negotiations conducted, before the Bill can be drawn up for the scrutiny of the Standing Orders Committee. All this has to be paid for, and the money must be charged to the capital cost of the undertaking. There is hardly a tramway authority in the kingdom which has not suffered from that burden, but the load placed upon the London Council Tramways Department is specially heavy. The land is probably the costliest in the world, and the opposed interests are both

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wealthy and influential. Taking, therefore, only the two points noted in the statements of Mr. Hume and Mr. Fell, it is amply evident that responsibility for the present position of London traffic facilities does not lie upon the London County Council or its tramway management, but that the fault lies elsewhere.

Publicity as a Factor in Policy.

In what are now probably regarded as the "good old days" prior to the war it was difficult for provincial municipalities desirous of running omnibuses to ascertain the receipts and working costs per mile of London omnibuses. Figures were given by manufacturers as approximate estimates, but the exact results were jealously guarded. A different attitude is now to be seen on the part of the company as the result of two circumstances. The first is that the vehicle manufacturing enterprise of the allied companies, is catering for the wants of municipalities and firms desirous of running omnibuses and industrial vehicles. The second is the outcry against the increased fares imposed as the result of the augmentation of working costs due to the war, and the recognition that the clamour can best be allayed by taking the public into their confidence. Consequently the company's advertisements in the newspapers during the past three months have contained items of information hitherto kept for the eyes of only the management and directors. The statements opened with the intimation that when in 1915 the shortage of omnibuses led the police to allow five standing passengers to be carried in addition to the 34 seated, the earnings increased by 24 per cent. up to 1916, while the expenses rose by 26 per cent. The fares were not advanced because the extra passengers paid for the extra cost. Thus, the announcement pointed out, the traveller got the benefit both ways. Then came a series of advertisements under the heading of "Aspects of London Traffic." One of these disclosed that in a recent week the highest earning route took 23d. per mile, while the lowest earning route gave only 13d. per mile, or less than the cost of working. After explaining the little-known fact that in order to give a complete and convenient transport system the omnibuses have to work some unprofitable sections on their routes, the announcement emphasised the circumstance that even before the war the company and its associates ran not less than 20 per cent. of their omnibuses at a loss, and that "only a large company with a tradition of public service would venture to give all this." Subsequent announcements have contained other items of information that the public should digest, including the disclosure that the early and late vehicles on many routes are not the profitable ones, and that each day approximately 25 per cent. of the trips are run not for the gain of the company but for the benefit of the community. The moral of this was enforced by the exhortation to "think of this the next time you find yourself standing in a crowded omnibus, and if you complain, also give thanks." Another series gives the increasing daily numbers of lorries which are being run as passenger vehicles at a loss of 5d. per mile. The importance of all this is brought out by an incident in which figured Sir F. Hall, one of the two or three practical men among the Members of Parliament who form the Select Committee of the House of Commons deputed to inquire into London traffic conditions. This former chairman of the County Council Highways Committee pointed out that the outcry against the high fares is chiefly due to a misunderstanding of the facts. It is to be regretted that those at present in authority on the Highways Committee have not taken the same means of enlightening the public as the allied companies have done. However, it is not too late to tread the right path, and recognition of this condition will be required whether or not a Traffic Board is appointed by the Government.

Cippenham and the Transport Bill.

Though the one relates to the past and the other to the future, the report of the Select Committee of Inquiry into the Cippenham motor depot and the debates on the Ways and Communications Bill in the House of Commons are closely connected, and there can be little doubt that the amendment of the Bill was greatly promoted by the report. According to the Select Committee's judgment, a Minister unfettered by Parliamentary control has spent the money of the nation needlessly and wastefully, and it is quite natural therefore that Parliament should endeavour to make sure that such a misfortune

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should not happen again. As originally presented, the Transport Bill gave the Ministry powers to expend capital to the amount of a million pounds on the acquisition of land, the breaking up of roads, etc., for the establishment of new forms of transport service. This spending power has been limited to an aggregate of half a million, and sanction of Parliament will be required before any further expenditure can be undertaken. As the Minister is also required to give owners of existing undertakings opportunity of establishing the service he regards as necessary, the safeguards now provided seem ample. Next, on Clause 11, giving power to discharge capital liabilities by issue of stock, the amendment moved by Sir Eric Geddes himself, limiting the issue to a million pounds at a time, seems a precaution wholly advisable. Another question raised was on the clause requiring the Minister to set up Advisory Committees for the purposes of the Bill. As it now stands, the clause provides that the Minister must constitute an Advisory Committee of experts and persons of wide business experience in the particular branch of industry or transport affected by the services he proposes to institute or the undertaking he intends to operate. By this clause the opponents of the Ways and Communications Bill certainly scored a victory; whether it can be said their triumph is a gain to the nation the future alone can determine. Consultation takes time, and therefore the practical activity of the Minister will certainly be rendered more deliberate than otherwise might be the case. Now that the Bill has passed the House of Commons, the Government is practically within sight of the accomplishment of its main purpose. The establishment of a Ministry of Ways and Communications is at least a recognition of the national importance of transport services, and the Ministry may, if properly advised and supported, evolve from the present chaos an ordered system which will efficiently serve the great transport requirements of the country. Sir Eric Geddes' speech on the third reading indicated that special importance will be attached to the road department, and that apprehensions of a check to road transport are unwarranted.

GLASGOW TRAMWAYS SEMI-JUBILEE.

Celebrating the Completion of Twenty-five Years' Work.

On July 1, 1894, Glasgow Corporation assumed possession of its tramway system, and on July 1, 1919, celebrated the semi-jubilee of the undertaking as a municipal concern. During the period between those two dates much history, both tramway and other, has been made. But if the formulation of ideas can be taken as events, Glasgow may be said to be celebrating its tramway jubilee. It was in 1869 the scheme for running tramways in Glasgow first took practical shape. There were then, however, many difficulties in the way of the enterprise. Tramway legislation was being shaped in Parliament, the issue of which was the Tramways Act of 1870, and among other provisions, the Act prohibited municipalities from operating tramway services. Glasgow civic authorities persevered, obtained special powers, constructed lines of tramways for horse-drawn traction from St. George's Cross to Eglinton Toll, traversing the main body of the city, and in 1871 leased the operation of the undertaking for a period of 23 years to the Glasgow Tramway and Omnibus Company, which had been formed for the purpose, with Mr. John Duncan as managing secretary. The line, which was 2¼ miles long, was opened for traffic in 1872. Under Mr. Duncan's able direction, the company prospered, and extended its lines year by year, till at the end of the lease, which expired in July, 1894, the company operated 33 miles of double track.

Three years before the end of the lease, negotiations for the transfer of the undertaking from company to municipal management were begun, but in 1892 it became evident that the sentiment of Glasgow citizens was wholly in favour of the Corporation assuming complete control. Relations with the Tramway and Omnibus Company were broken off, and Glasgow Town Council began to prepare for entering upon tramway business. Mr. John Young, then head of the Cleansing Department, which he had brought to a remarkably complete condition of efficiency, was appointed general manager, with Mr. W. E. Clark as engineer.

In the two years of interval, a completely new tramway service had been organised. New depots had been built, new cars constructed, nearly 3,000 horses bought and trained, the whole staff of drivers and conductors organised and uniformed, and everything down to the tickets and punches was in readiness for the start on July 1, 1894.

Glasgow is fortunate in the number of able men who are willing to spend themselves on municipal service, and to the Town Council of that day the successful inauguration of the tramways was not a little due, but the chief part of the burden fell on the shoulders of Mr. John Young and his assistants, who included Mr. W. E. Clark, Mr. James Dalrymple, and Mr. J. B. Hamilton, and others now well known in the tramway world. Mr. Young's genius showed itself to be at once comprehensive and intensive, laying out the system on broad lines and yet attentive to the minutest details. A masterful organiser, he had the gift of acquiring the confidence of the public and winning the loyalty of his employees.

Begun under such auspices, Glasgow Corporation Tramways have grown and prospered, extending lines in all directions, perfecting the system organically and as a traffic utility, affording Glasgow citizens the cheapest system of passenger transport in the world

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and winning golden opinions from expert observers everywhere.

Mechanical traction had been in the view of Glasgow municipal authorities from the first, and in 1890 the matter was taken up seriously by the Tramways Committee. In 1891, Parliamentary powers to institute mechanical traction were obtained, and as soon as the system had been taken over, enquiries as to the best form of mechanical traction were instituted. About two years later, Mr. John Young and Mr. W. E. Clark were deputed to make enquiries in the United States, and in their report they strongly recommended electric traction on the overhead trolley wire system. The report was accepted, and in 1898 the first electrified section of Glasgow tramway system was opened for traffic. The success of the experiment was complete, and electrification of the whole system was undertaken, with Mr. H. F. Parshall as consulting electrical engineer. By the end of 1901, the electrification of the whole system was practically complete, and within a short time the last horse-drawn car disappeared from Glasgow streets.

In another column of this issue, the annual report of Glasgow Corporation Tramways Department is given statistically, and it is needless therefore to repeat the figures here. With a revenue of £1,531,000, carrying 000,000,000 passengers, at a fare averaging 2·3 miles for a penny, Glasgow tramways show a financial success combined with public utility sufficiently remarkable, and details of its history do not detract from the impressiveness of the record. To Mr. James Dalyrmple, the present general manager, and his staff, not a little credit for the splendid result is due.

Under normal circumstances, and in times less agitated, the citizens of Glasgow would doubtless have celebrated the semi-jubilee of the Corporation tramways as a general holiday, and made it the occasion of civic festivity, but the Town Council wisely decided that, in view of the coming peace and other celebrations, the citizens might prefer a less conspicuous method of remembering the day. Invitations were sent to former members of the Town Council, ex-lord provosts, ex-conveners of tramway committees, former municipal officials, and all those who had taken active part in building up the undertaking, asking them to join with the Town Council in celebrating the event.

The Corporation Tramways Department had arranged the programme of festivities, which included a visit to Coplawhill Tramway Car Works, and a luncheon in the City Chambers, the company to be conveyed to and from the works in tramcars. A numerous and representative assembly gathered at the City Chambers, and the company were conveyed in the tramcars to Coplawhill, a notable feature in the procession being a horse-drawn car taking precedence of the electrically-driven vehicles.

After a tour of inspection round the extensive works, the company returned in the tramcars to the Municipal Buildings, where luncheon was served in the City Banqueting Hall.

Councillor Kelly, convener of the Tramways Committee, who presided at the luncheon, referred to the fact that the Corporation of Edinburgh were taking over the tramway system of their city. At his suggestion, it was agreed to send the following telegram to the Lord Provost of Edinburgh in name of the Lord Provost of Glasgow :—"The Corporation of Glasgow are celebrating the twenty-fifth anniversary of the municipalisation of the tramway system to-day. Members convey congratulations and wish Edinburgh great success in their new enterprise."

Sir Samuel Chisholm, Bart., proposed the toast of "The Lord Provost and the Corporation."

The Lord Provost (Mr. J. W. Stewart), in reply, said there was no tramway system in the country, probably not in the world, which could excel that of Glasgow. They were approaching the time when the expenditure had increased so much that they would have to consider carefully how increased revenue could be obtained.

Councillor Kelly, replying to the toast of "The Tramways Department," proposed by Sir John Ure Primrose, said that the history of the tramways during the last 25 years was a magnificent record. He referred to the increased costs of labour and materials, and stated that, even with the wonderful increases in revenue shown since the beginning of the present financial year, they were not paying expenses. He also pointed out that increased facilities were in demand, and the Tramways Department had extensive plans for meeting the demand, but additional revenue was absolutely necessary if these plans were to be carried out. He hoped the committee and the Corporation would not hesitate to give the department that revenue which would enable them to go during the next 25 years at the same rate of rapid progress as during the past 25 years.

Sir Robert Graham proposed the toast of the officials. He said a great deal of the success of the undertaking had been due to Mr. Dalrymple and his staff.

In replying, Mr. James Dalrymple said that some of them were too apprehensive regarding the future to be able to spend much thought on the past. More revenue was required, and he believed that, when the citizens of Glasgow had the whole of the facts before them, they would do what was right. There were many things that were troubling them to-day. For instance, they were turning out a car every week in the works the members of the company had just visited, but they could not put the cars into service because of a lack of material, due, he believed, to shortage of labour. They had seen paragraphs in the newspapers regarding a contract for rails. Why had that contract gone to America ? Rail makers in Middlesbrough were on strike, and they had to go to America for the raw material. He could not sufficiently express his feelings that the Corporation of Glasgow had to do such a thing, but it was unavoidable. Since they came into that building a telegram had been received from the Board of Trade asking for an explanation. He had no doubt that the committee were quite able to give a thorough explanation in regard to the matter.

Sir Daniel M. Stevenson, Bart., proposed the health of the chairman, and Councillor Kelly replied.

SANDBERG'S "IN-SITU" TREATMENT.

The Manchester Corporation Tramways Committee, after an extensive trial of Sandberg's "In-Situ" treatment, have recently placed an order with Messrs. Scholey and Company, Limited, 56, Victoria Street, London, S.W.1, the licencees for the process, for the immediate treatment of about eight miles of single track. The encouraging reports from undertakings where the treatment has been applied afford ample evidence of the foresight of the Manchester Committee, which was one of the first Committees to appreciate the possibilities of the process, and no doubt evidence of the material advantages of their enterprising policy will soon be forthcoming.

ST. ANNES COUNCIL PURCHASE TRAMWAYS.

St. Annes-on-Sea Urban Council have decided, subject to the sanction of Parliament, to purchase the undertaking of the Blackpool, St. Annes, and Lytham Tramways Company, Limited, for £140,000. The tramway has a route length of 7·47 miles. Gas power was originally used, but electric traction was introduced in 1904. The company has a share capital of £125,000, and the debentures amount to £150,000. The revenue for the year ended December 31, 1918, was £44,348, and the working expenses £34,000, leaving a balance of £10,348 for debenture interest. The arrears on debenture interest amount to £47,375.

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EDINBURGH TRAMWAYS.

TRANSFER FROM COMPANY TO MUNICIPAL MANAGEMENT.

The transfer of Edinburgh tramways from the Edinburgh and District Tramways Company to Edinburgh Corporation took place on Tuesday, July 1, the company's lease having expired. The Corporation have been owners of the tramways for a long period, but the operation of the system has been carried on by a company which was formed in 1894 for the purpose of leasing and working the lines. The history of tramway development in Edinburgh contains many points of interest. Though apparently backward in tramway enterprise, Edinburgh was really very early in the field. As far back as 1877, a private company established a horse-drawn tramway there, and in 1884 the Edinburgh Northern Tramways Company introduced a cable tramway along Hanover Street and Frederick Street, carrying passengers from the vicinity of Princes Street to the southern residential portions of the city. In 1893 Edinburgh Corporation sought powers to acquire and operate tramways, and promoted a Bill in Parliament for that purpose. The Bill was passed, but with serious limitations; the Corporation were prohibited from working the lines themselves, and the Government refused sanction for electrification. Possessed of these limited powers, the Town Council acquired the horse-car lines in 1893, with the exception of a small section reserved for reasons too numerous to detail, and which had to be acquired a few years later. The operation of the tramways thus acquired was leased to Messrs. Dick, Kerr and Company, who arranged with a local company, the Edinburgh and District Tramways Company, to undertake the actual working of the lines, the latter providing rolling stock and other movable working plant. In 1896, the Corporation purchased the cable tramways, and subsequently the cables were gradually extended throughout the system. A complete account of the installation, with many illustrations, will be found in the issue of this journal for March, 1900. In 1897 the Corporation obtained powers to use electric power and to operate the system themselves. A new lease was then granted in favour of the Edinburgh and District Tramways Company as working tenants, with Messrs. Dick, Kerr and Company bound jointly and severally along with them for all rents and tenants' obligations. This lease expired on June 30.

For several months Edinburgh Corporation have been making preparations for taking over the operation of the undertaking. Fares have been arranged, Mr. R. S. Pilcher, formerly manager of Aberdeen Corporation Tramways, was appointed general manager, agreements were made with the employees, and new uniforms were provided for drivers, conductors, and other officials, so that everything was ready for the opening day. To mark the occasion a luncheon was given to members of the Council in the City Chambers. Lord Provost Sir J. L. MacLeod, who presided, gave the toast of "The Tramway Undertaking." He said that informal gathering marked a notable occasion in the municipal history of Edinburgh, the taking over of the tramway system into their own hands. They were now, as regarded the tramway system, masters in their own house. It was proper to recollect at that time that while they as a Corporation were the owners of the undertaking at the time of the original lease, the question of their running the tramways themselves was a matter of considerable controversy. It was gravely questioned whether municipalities were entitled to go in for schemes of trading such as the tramway undertaking involved. That was the reason for the granting of the original lease. Many criticisms were directed against the tramway policy of the city and against the Tramway Company, some legitimate and others not so, but now it was felt that they as a Corporation should take the control and running of the system into their own hands. During the later years of the lease many difficulties, trials, and anxieties had been imposed on the Tramways Committee and the Town Council, and they had on the whole been successfully encountered and overcome. The committee were entitled to be congratulated on their achievement, and also on the fact that they had prepared a policy for the future. The system was to be radically reconstructed and converted, and that decision entailed much labour and arduous work on the part of the committee.

Councillor Harrison, chairman of the Tramway Committee, in reply, said the past had been a worry to them all; the future was fair work. After a retrospective account of the city's tramways since the first horse tramways were laid down in 1877, and the first cable line in 1884, he said that in the past the Tramway Committee had been bound hard and fast by the lease of 1898, and so they were completely out of harmony with public opinion; they had been dragging the chains that bound them. Things could not be put right at once in the present state of trade, and he asked the public to be patient and to thole a little while till they got a firm hold on things.

On the call of Baillie Watson, the toast of the Lord Provost was honoured.

Mr. Harrison submitted the toast of Mr. Pilcher, the tramway manager, who, in reply, said he had examined the tramways, and he could only wonder at the patience of the people with their unique system. The new electric system could not be ready for some time, but he hoped in the meantime to improve the management of the present system. He had been commiserated on his job, but it was not in the least depressing him. The more defects there were the more chance there was of showing improvement.

CONGRATULATIONS FROM GLASGOW.

During the day, the Lord Provost, Sir J. Lorne MacLeod, received the following telegram from Lord Provost Stewart, Glasgow:—"Corporation of Glasgow celebrating twenty-fifth anniversary of municipalisation of tramway system to-day. Members convey congratulations to Edinburgh, and wish great success in their new enterprise." Lord Proviost Sir J. Lorne MacLeod replied:—"Many thanks for congratulations and good wishes for success of Edinburgh tramways under the Corporation. We send you our best wishes on your twenty-fifth tramway anniversary, and heartily reciprocate your friendly sentiments.—J. Lorne MacLeod, Lord Provost."

RAILLESS OMNIBUSES FOR YORK.

The York Tramways Committee have been considering the use of a railless system for the Heworth district, and Mr. J. W. Hame, general manager of the Corporation Tramways, has now recommended that the Corporation should use the powers obtained in 1914 to construct a railless system along St. Saviour's Gate and Layerthorpe Road to Heworth Church, and along Heworth Road to Stockton Lane. The length of route is about one and one-third miles. The estimated cost of the overhead construction is £3,668, and of four railless vehicles, £8,000. Mr. Hame recommends another route from Parliament Street to Haleys Terrace. In this case the estimated cost of construction is £4,125, and of three railless vehicles, £6,000. While petrol omnibuses could be used, Mr. Hame considers that with the present price of benzol the saving with the railless system would be more than sufficient to pay the interest, sinking fund, and maintenance charges on the overhead lines, while the railless vehicles would provide a customer for the city's electricity department.

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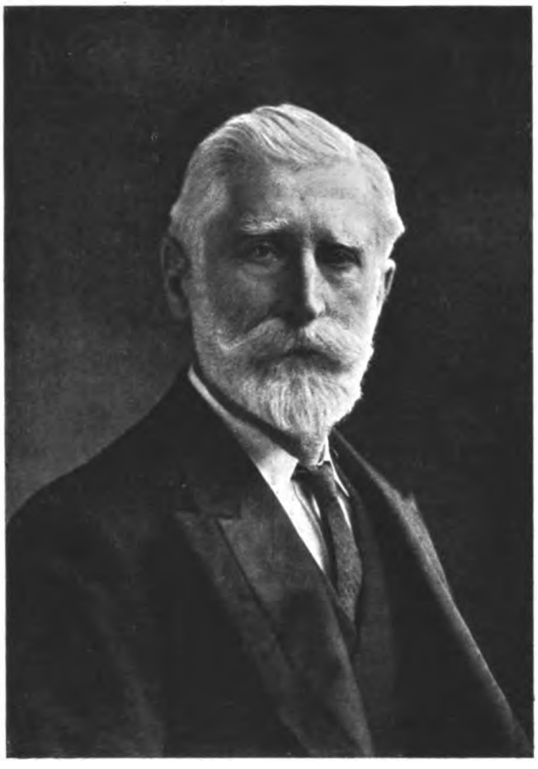
DEATH OF MR. WILLIAM MARTIN MURPHY.

CHAIRMAN OF THE DUBLIN UNITED TRAMWAYS COMPANY.

We deeply regret to record the death of Mr. W. M. Murphy, chairman of the Dublin United Tramways Company, and a well-known figure in British public life, which occurred at his residence, Dartry, Upper Rathmines, on the morning of Thursday, June 26. The only surviving son of Mr. Denis W. Murphy, Co. Cork, a contractor of some note in the South of Ireland, Mr. W. M. Murphy was born in 1844, at Bantry, and received his early education in a private school there. In 1858 he entered Belvedere College, Dublin, where he had for fellow students some of the men who have helped to make Irish history, notably the Sullivan family, three of whom—Mr. D. B. Sullivan, Mr. A. M. Sullivan, and Mr. T. D. Sullivan—played conspicuous parts in the House of Commons during the great years of Home Rule agitation in the 19th century.

After finishing his college course, Mr. Murphy became a pupil of a Dublin architect, and took up his new studies with marked zeal. But in the year 1863 his father died, leaving several of his contracts unfinished, and the young man, then only in his nineteenth year, was called upon to take them in hand. This he did so successfully



The Late William Martin Murphy.

that the business grew, and as a large proportion of the contracts were Government work, he decided to make Dublin his headquarters. The young contractor here found his congenial sphere. His outlook was wide and his mind receptive; he was interested in literature, politics, commerce, and finance, and in the Irish capital a man may share in all those activities without becoming wholly monopolised by any of them.

Mr. Murphy undertook several railway contracts, and his attention was thus drawn to tramway enterprise then just beginning to make headway. Dublin, it seemed to him, was a favourable field for that mode of traction, and in conjunction with a few congenial spirits he founded what is now known as the Dublin United Tramways Company. For many years the cars were drawn by horses, and the company continued to be one of the most successful tramway enterprises in the United Kingdom. The progress of electric traction in America early attracted Mr. Murphy's attention, and in 1895, in company with the late Mr. William Anderson, the general manager of the Dublin company, he visited a number of cities there and inspected the electric tramway and power installations. So convinced was he of the advantage of electric traction that immediately after his return home Mr. Murphy proposed that electricity should be employed as the motive power for the Dublin tramways. Plans for installing the overhead trolley system were prepared, and within a very short time electric cars were in operation on the Balls Bridge line, which was the first section to be electrified. The equipment of the system was continued, and within a few years the last horse car had disappeared from Dublin. For the first time on this side of the Atlantic the great possibilities of electric traction were thus demonstrated. It is unnecessary to recount here the remarkable history of the Dublin United Tramways Company under the direction of Mr Murphy, the successive extensions, the years of prosperity, the determined and victorious resistance to an unjustifiable strike, and all the facts that make up the record of one of the most important tramway systems in the British Isles.

During these years, Mr. Murphy had also been engaged in either the management or construction of a number of other tramway companies, and railway companies as well. He took part as contractor, promoter, financier, or director, sometimes in one, and at other times in all of these capacities, in the following list of tramways:—Dublin United, Belfast, London Southern, Cork Electric, Isle of Thanet Electric, Hastings and District, Bournemouth and Poole, and Paisley and District. The railways, also, make a long list, and to Mr. Murphy the following railways owe their construction:—Wexford and Rosslare, Clare and Banagher, West Clare, Mitchelstown and Fermoy, South Clare, Tuam and Claremorris, Skibbereen and Baltimore, and Banbury Extension.

Viewing his achievements in transport, his activity in promoting, planning, financing, and constructing tramways in various parts of the British Isles, and railways as far distant as the Gold Coast of Africa, one might conclude that Mr. W. M. Murphy was wholly absorbed in those lines of enterprise, but there was no practicable business proposition to which he was not willing to lend a hand. In company with two friends, he established the firm of Clery and Company, which has grown into a highly important commercial concern. Other businesses he also assisted by purse and advice, and his importance in Dublin business life is indicated by the fact that he was president of the Chamber of Commerce for two years in succession.

We have already hinted that Mr. Murphy had high political ideals and strong intellectual interests. Perhaps one of the greatest surprises recently sprung on the British public from Ireland was the revelation that the uncompromising opponent of insurgent Labour was also an ardent Home Ruler and the proprietor of *The Irish Independent*, the most powerful organ of the Nationalist Party. But so it actually was, and to the intellectual force and business sagacity of Mr. W. M. Murphy the Irish Nationalist cause owes a great journalistic success. His association with the most intellectual group of Irish political leaders, and his close connection with business and finance, enabled him to take wide views of politics, and his judgments were recognised by all parties as worthy of consideration.

Everyone who came in contact with Mr. W. M. Murphy recognised in him a man of high ability, just in his judgments, clear sighted, and yet quietly sociable, and kind in all his personal relations.

AMERICAN ORDERS FROM SOUTH AFRICA.

Mr. Houston asked the President of the Board of Trade whether he was aware that recently the Union of South Africa Government had placed in the United States orders for 44,000 tons of rails, 1,000 cars, 200 trucks, and in the United States and Canada, 70 large locomotives, and whether he could state the reason for placing these important orders for material in America instead of in this country. Lieutenant-Colonel Amery, in reply, said that some of the orders referred to were placed before the armistice, when it was impossible to supply railway material from this country. As regards the 70 locomotives which had been ordered since the armistice, he had been informed that the British offers in respect both of price and the date of delivery were so unfavourable that the South African authorities felt themselves obliged to go further afield. Forty of the locomotives had been ordered in Canada. Contractors in this country could not expect preference from other Governments in the Empire except as against foreign countries.

BRITISH ROLLING STOCK AND THE WAR.

Mr. Foster, Financial Secretary to the War Office, has stated in the House of Commons that the rolling stock transferred from British railways and sent abroad during the war comprised 529 locomotives, 30,021 wagons, 31 ambulance trains, and 16 other trains. Such of this material as is not now required abroad is being returned as rapidly as available transport permits. Already 439 locomotives, 3,000 wagons, and 13 other trains have been returned.

GATTIE TRANSPORT SCHEME.

Sir A. Geddes has stated that a committee are investigating Mr. A. W. Gattie's proposals for improving the method of handling goods in traffic, and to consider the practicability of the introduction of any of the suggested improvements into the existing transport system. The committee will consist of Sir J. Fortescue Flannery, Bt., Sir John Aspinall, Mr. F. T. Hopkinson, General Sir Philip Nash, and a representative of Labour. It has not yet been decided whether the inquiry will be public.

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LONDON COUNTY COUNCIL TRAMWAYS.

ANNUAL ACCOUNTS, 1918-19.

At the meeting of the London County Council on July 1, the tramway accounts for the year ended March 31, 1919, were submitted by the Highways Committee, together with a memorandum by the general manager (Mr. A. L. C. Fell), on the working of the undertaking. In accordance with pre-war practice the accounts were completed in time to be submitted on the date fixed for the presentation of the annual estimates for the current year.

The tramway system on March 31, 1919, extended over a total length of 149·07 street miles, of which 144·47 miles were electric lines (122 conduit and 22½ overhead), and 4·6 miles horse lines. The whole of the system is worked by the Council with the exception of 2·8 miles (partly double and partly single line) in Harrow Road, which is worked by the Metropolitan Electric Tramways, Limited, on the overhead system of electric traction. The undertaking comprises the lines transferred to the Council from various tramway companies, together with new lines constructed by the Council.

The only horse tramway routes not yet electrified are those in Burdett Road and Grove Road, etc., and in Southwark Park Road, etc., and as the services on these tramways have been withdrawn, the system in operation by the Council consists entirely of electric tramways, the total length being 141·67 street miles, i.e., excluding the 2·8 miles in Harrow Road.

The following table gives the total income from the undertaking during the year, and the working expenses, compared with the results in preceding years :—

Year ended March 31	1919	1918	1917	1916	1915	1914
	£	£	£	£	£	£
Income	3,578,256	2,932,140	2,552,203	2,339,291	2,399,487	2,268,669
Working expenses* ...	2,858,414	2,128,686	1,817,694	1,683,660	1,700,212	1,615,467
Surplus on working ...	719,842	803,454	734,509	655,631	699,275	653,202
Deductions—						
Debt charges—						
Interest	264,434	293,568	314,164	326,477	330,300	...
Redemption	430,458	428,319	429,851	425,908	405,605	...
	694,892	721,888	744,015	752,385	735,905	736,602
Rent drawbacks, etc.	...	...	7,551	6,797	1	...
Income tax, etc. ...	109,786	75,661	73,000	40,000	32,102	28,197
Parliamentary expenses, etc. ...	...	...	1,546	2,260	2,803	2,082
	804,678	797,549	826,112	801,442	770,811	766,881
Less tax, deducted interest, rents, etc. ...	92,905	89,654	102,945	72,061	38,363	25,153
Total deductions from surplus	711,773	707,895	723,167	729,426	732,448	741,728
Balance	8,069 (Surplus)	95,559 (Surplus)	11,342 (Surplus)	73,795 (Deficiency)	33,173 (Deficiency)	88,526 (Deficiency)

* Includes war service allowances—1918-19, £162,128; 1917-18, £119,432; 1916-17 £110,155; 1915-16, £95,365; 1914-15, £42,209.

The surplus of £8,069 5s. 11d. includes a credit of £2,250 allocated to the tramways account in the distribution of the balance of the aircraft section of the Council's insurance fund.

Passengers Carried, Operating Expenses, etc., of Electric Lines.

Year ended March 31.	Electric track miles open.	Average passenger receipts.	No. of passengers carried.	Traffic receipts.
		£		£
1907	40·66	19,929	183,062,063	810,320
1908	61·91	20,223	279,166,461	1,252,001
1909	77·94	19,752	344,705,937	1,539,434
1910	99·61	18,546	418,317,377	1,847,327
1911	116·98	17,925	482,296,935	2,096,914
1912	127·55	17,498	516,092,489	2,231,902
1913	132·49	16,179	501,102,149	2,143,559
1914	136·62	15,967	516,338,859	2,181,344
1915	140·66	16,516	547,253,332	2,323,130
1916	141·52	16,097	545,247,747	2,278,115
1917	141·67	17,479	586,127,976	2,476,309
1918	141·67	20,206	593,516,141	2,862,554
1919	141·67	24,487	636,157,361	3,469,165

Capital Expenditure and Repayment.

The capital expenditure on the undertaking up to March 31, 1919, amounted to £13,693,751, of which £34,162 represents expenditure during the year 1918-19. The amount of the debt incurred up to March 31, 1919, was £14,022,834. The debt outstanding, after allowing for debt repaid out of revenue and sinking fund balances and for £120,216 in respect of the value of surplus land was £8,349,817.

The sums paid out of the revenue of the undertaking during the past seven years for the redemption of debt have been as follows :—

	£		£
1912-13 ...	388,042	1916-17 ...	429,851
1913-14 ...	408,488	1917-18 ...	428,320
1914-15 ..	405,605	1918-19 ...	430,458
1915-16 ...	425,908		

The total amount of debt repaid out of revenue up to March 31, 1919, was £5,133,040, to which must be added an amount of £419,760 from proceeds of sales, making in all £5,552,800.

The amount of capital expenditure, which up to March 31, 1919, had become obsolete owing to the electrification of horse tramways, was £2,024,687, or deducting sales £332,814, the net capital expenditure amounts to £1,691,873. The debt in respect of this expenditure has been reduced to £886,088, the amount provided out of revenue for redemption having amounted to £805,785. Certain other expenditure amounting to £149,756, incurred in connection with electric traction, has also been rendered obsolete. The repayment of this is being provided for over short terms specially approved by H.M. Treasury.

Renewals Fund and General Reserve Fund.

The renewals fund amounted on March 31, 1919, to £261,413. Up to the year 1911-12 full provision for this fund was made out of the revenues of the undertaking on the basis approved on June 23, 1908, of two-thirds of a penny for each car mile run, but the financial results of the working of the past seven years have not enabled provision to be made on this basis. During this period the available surpluses have only been paid into the fund, including in 1918-19 the surplus of £8,069. The consideration of the basis of the provision has been postponed from time to time. The expenditure on renewals during the year 1918-19 amounted to £80,155.

The general reserve fund on March 31, 1919, amounted to £76,790. In the case of both the renewals fund and the general reserve fund the balances stated take no account of the depreciation of investments.

War Service Allowances, War Wages, and War Bonus.

The total of the war service allowances granted by the Council and charged to the tramways account during 1918-19 in respect of men serving with the Forces of the Crown amounted to £162,128. From the outbreak of war until March 31, 1919, the tramways account has been charged with a total amount of £529,290 for war service allowances. The cost of the war wages and war bonus to employees during 1918-19 was £832,992, the total sum paid in this respect since the commencement of the war to March 31, 1919, being £1,330,005.

Rates, Maintenance of Paving in Tramway's Area, and Street Widenings.

The total sum paid to metropolitan borough councils as rates on the permanent way amounted in 1918-19 to £77,723, and represents an average relief to the rates of London of about ·4d. in the £. This amount of £77,723 is in addition to rates and taxes paid by the Council in respect of tramway offices, car sheds, sub-stations, depots, etc.

The saving to the road authorities in consequence of the obligation of the Council to maintain the paving along the tramway routes is estimated by the Council's officers at about £184,000 a year on the present mileage; this estimate being based, of course, on the normal standard of maintenance.

The aggregate amount chargeable to the tramways account in respect of the cost of effecting street improvements carried out along tramway routes, under resolutions already passed by the Council, is approximately £800,000, of which £735,542 had already been so charged up to March 31, 1919. The amount estimated to have been paid to tramway companies (as part of the purchase money for their undertakings) in respect of the expenditure incurred by them on street improvements is £40,576, the whole of this amount being charged to the tramways account.

The amount actually charged to the tramways revenue account during the year 1918-19 in respect of rates on tracks (£77,723) and debt charges on street improvements (£36,147), together with the estimated saving to local authorities on maintenance of paving (£184,000) gives a total of £297,870, and various rates were therefore relieved to this extent.

Annual Estimates, 1919-20.

The following is a summary of the estimated results of the working of the Council's tramways for the year ended March 25, 1920 :—

		£
Total receipts (including advertisement rents, etc.)		4,475,000
Total working expenses (including war service allowances and £10,000 provision for contingencies)		3,531,925
Surplus on working		943,075
Interest on bank balances and rents, etc.		19,386
		962,461
Charges against working surplus—		
Debt charges (£426,833 for repayment of capital and £252,840 for interest on capital expenditure) ...	£679,673	
Income tax (*less* tax deducted and retained from interest paid), expenditure on surplus property, and sundry items	70,221	
		749,894
Estimated net surplus (to be transferred to the renewals fund) ...		212,567

Passenger receipts, it is estimated, will average 19·88d. a car mile on an estimated mileage of 53,000,000, while the working expenses will amount to 15·59d. per car mile. The great increase in working expenses thus indicated is due mainly to advances in wages and increases in the price of materials. The institution of the 48-hour week for the operating staff will entail an additional

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yearly charge of £360,000. The wages bill for 1919-20 is estimated at £2,421,250, an increase of £1,319,030 as compared with the year 1913-14.

The number of passengers carried and the car miles run during recent years, together with the passenger receipts a car mile and the working expenses were as follows :—

Year.	Passengers carried.	Car miles run.	Passenger receipts a car mile.	Working expenses a car mile.
			d.	d.
1912-13	512,652,700	53,943,104	10·04	6·62
1913-14	522,952,600	59,209,289	9·21	6·50
1914-15	550,498,000	58,978,792	9·77	6·89
1915-16	545,423,200	47,879,675	11·73	8·44
1916-17	586,128,000	49,478,973	12·38	8·82
1917-18	593,516,141	49,189,886	14·30	10·38
1918-19	636,157,361	48,052,801	17·87	14·27

The estimates include provision of £50,000 for the payment of allowances to officers and employees still on war service.

The total rates payable in 1919-20 are estimated at £125,970, including £77,900 for rates on permanent way. In the previous year the amount paid in rates represented an average of ·4d. in the £.

The total capital expenditure incurred on the tramways up to March 31, 1919, amounted to £13,693,752. Deducting repayments up to March 31, 1920, the net debt will stand at £8,180,000.

Briefly summarised, the result of the working during the past five years, 1914-15 to 1918-19, taking into account the sums actually expended on renewals, and after providing for redemption of debt and payment of interest on loans, has been a total deficiency of about £420,000, which has been met out of the balances of the general reserve and renewals funds. The current year's estimates anticipate that £212,567 will be available for addition to the renewals fund in 1919-20, and that sum will be added to the renewals fund, which at March 31, 1919, stood at £111,602. Against this figure has been set the amount of £371,480, so that if the estimates are realised, it will be necessary to draw on the balance of the renewals fund to the extent of £149,811. The committee add that from these figures it is clear that the Council has not over-estimated the necessities of the situation in revising fares, and that the utmost caution will be necessary in dealing with suggestions for fare reduction. In order to correct any wrong impression, the Highways Committee emphasise the fact that no charge on account of the tramways has ever been borne by the rates.

ESTIMATES OF CAPITAL EXPENDITURE.

The estimates of expenditure on capital account for the tramways for the ensuing year include the following :—

Reconstruction of new lines	£555,060
Greenwich power station, substitution of reciprocating engines by turbines, etc.	49,920
Schemes under Tramways and Improvements Bill, 1919	50,000
	£655,050

ROTARY SWITCHES FOR TRAMCAR LIGHTING.

THE TOK MANUFACTURING COMPANY.

Apart from the natural desire of all British tramway managers to get as much of their material as they can from the home manufacturer, there has been so much trouble during and since the war in obtaining switches for controlling the lights on tramcars that everyone who has experienced the trouble will give a sigh of relief at being able to get these switches freely once more. For some reason or other best known to the makers, and probably not unconnected with a fear of dumping, this type of switch has always been an American product, and has remained as such long after most other tramway accessories have become Anglicised. Be that as it may, someone has been found willing to believe in the politicians' promises of protection, and Tok rotary switches are a result. Both the originators of this new English business will be known to many of our readers—Mr. H. H. Holmes, who, together with Mr. Seabrook, made electrical history at West Ham and Marylebone, and Mr. E. E. Sharp (we beg his pardon, Captain Sharp), who is responsible for most of the C. and H. meters which have found their way on to tramcars the world over. From their past record we know that these two gentlemen will deserve success; we think they will get it too.

They have wisely decided not to make alterations in the original American design; they are even keeping the fixing and wiring holes the same, so that there will be no bother in replacing old switches with the new British ones. The address of the firm is the Tok Manufacturing Company, Limited, Empire Works, West Ham Lane, London, E.15. We wish them all success.

WILKINSON'S SHOE TROLLEY HEAD.

A novel type of trolley head, in which a collector shoe takes the place of the usual trolley wheel, has been placed upon the market by the Britannia Lamp and Accessories Company, Limited, of Milton Street, London, E.C.

As will be seen from the illustrations, the trolley head is extremely simple in design, the parts being few, of robust construction, and without complication of any kind. It has been designed by Mr. Wilkinson, manager of the Bradford Corporation Tramways, and previous to handing it over to the Britannia Company for manufacture and sale Mr Wilkinson carried out most exhaustive tests, which convinced him that the shoe collector was an improvement upon the wheel form of head. The collector shoe is constructed of a special quality of cast-iron, and is of such a section (Fig. 1) that all

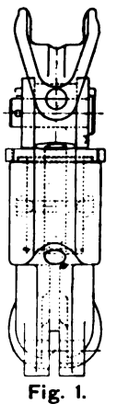

Fig. 1.

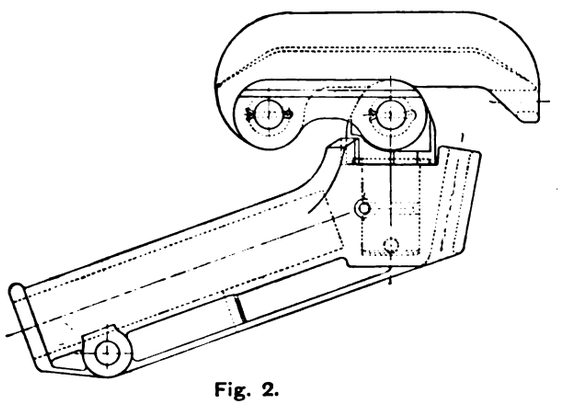

Fig. 2.

makes of overhead fittings can easily be taken, and at the same time the liability to leave the trolley wire is very much less than with the wheel. The shoe is mounted upon a pair of links, being connected thereto at one end by means of a steel pin. The other end of the links is connected to the swivelling part of the trolley head also by a steel pin. This method of mounting together with the shape of the links enables the collector to fall clear of the overhead fittings in the event of its leaving the wire, and makes it impossible for the head to foul the span wires. Fig. 2 shows the trolley head in running position, and in Fig. 3 the head is seen with the shoe out of action. In order to replace the collector on the wire a trolley rope is attached to the free end of the shoe, and led through a vertical sleeve attachment cast in the end of the body part of the head. By pulling on this trolley rope the shoe is brought up into running position, and aligns itself with the pole, when it can be placed on the trolley wire.

An important feature in connection with the use of this head is the fact that owing to the large area of contact sparking is entirely

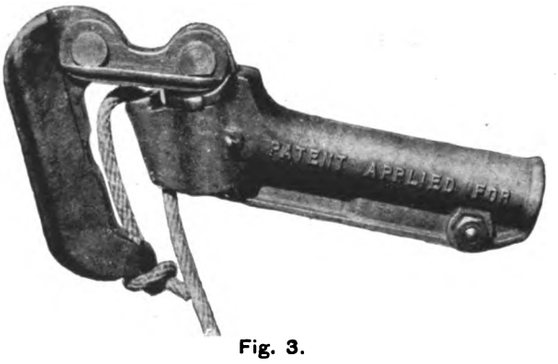

Fig. 3.

eliminated, consequently the wear on the trolley wire and overhead fittings is considerably less; moreover, it takes all frogs and crossings quietly, and this at a higher speed than would be possible with the wheel type of head. Less tension can be used, also, owing to the large contact area.

Although the head is only now being offered in quantities, several trial orders have been filled, and it is of interest to note that the reports in each case are very favourable, and a number of repeat orders have been received. Speaking after some months' trial, a tramway manager states that no apparent deteriorating effect on the trolley wire or overhead gear can be detected, while there is less knock than with the ordinary trolley wheel when passing under section insulators or through crossings.

The stock sizes of the heads ready for immediate delivery are bored for 1 in., 1¼ in., and 1⅜ in. trolley booms, but other sizes can be supplied where desired.

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GENERAL SECRETARY TO THE MUNICIPAL TRAMWAYS ASSOCIATION.

Mr. J. BECKETT APPOINTED.

The announcement that Mr. J. Beckett, borough treasurer of Accrington, has been appointed general secretary to the Municipal Tramways Association will be received with pleasure and approval by the members of the association. The National Council had no light task in making the appointment, no fewer than 740 candidates having offered themselves for the position. The high qualifications of the candidates may be estimated by the short list finally selected for interview. In addition to Mr. Beckett the list was as follows :—Messrs. J. W. Dudley Robinson, B.Sc. (Hons.), Lond., F.G.S., officer, R.E.; H. P. Conibear, F.C.I.S., secretary, Lancashire United Tramways, Limited ; D. R. Lamb, of the general manager's office, London, G.C. Railway ; S. Proctor, Deputy Town Clerk, Huddersfield ; H. R. Watling, solicitor, assistant secretary and legal adviser to the Road Board, London ; S. F. James, solicitor, Town Clerk, Ilkeston ; R. H. S. Butterworth, solicitor, formerly Town Clerk, Wimbledon.

In announcing Mr. Beckett's resignation from the office of borough treasurer at Accrington Town Council meeting on July 7, the Mayor,

Mr. J. Beckett.

Alderman D. C. Dewhurst, said he regretted very much that the Council were about to lose the services of one of their chief officials, Mr. Beckett, who had been with them about 35 years—a good, faithful, and diligent officer. Mr. Beckett had been offered and accepted positions of very great honour. He had been appointed general secretary to the Municipal Tramways Association of Great Britain, and also secretary to the Municipal Employers on the Industrial Council, with freedom to act in that capacity for remaining employers. It was a great honour to one of Accrington's citizens to have a position of such importance given to him. Whilst they felt a great amount of distress at the link between them being broken, they could not do less than wish him God speed in his new undertaking.

Alderman Lupton, chairman of the Finance Committee, remarked that though on entering the Town Hall that afternoon he was shocked on hearing the announcement of Mr. Beckett's resignation, he was not at all surprised that the town was about to lose his services. He had said again and again, both in private and publicly, that Accrington was not big enough for Mr. Beckett. At conferences he attended people had expressed to him their surprise that they were able to keep a man of his ability in Accrington. They knew the way he had been appreciated at important conferences, and how he had been frequently called upon to submit papers or take part in debate. Accrington was losing a very valuable servant, and they greatly regretted he was leaving them.

Mr. Beckett expressed the emotion he felt at the generous references to his services, and the regret he experienced in severing a connection lasting thirty-five years. He hoped to have some opportunity of saying what was in his heart regarding all those years at a future time.

Commenting on the event, the "Accrington Observer" remarked that "Mr. Beckett has long been recognised as one of the most able borough treasurers in the country, an expert in municipal finance whose help and advice have been widely sought, and whose skill and experience has been of the greatest value to the town he has served so long and so well. A man of unbounded energy and ready resource, few men are able to sum up a situation so quickly and to see at a glance the essence of any question as it will affect Corporation finances. . . . Mr. Beckett's withdrawal from Accrington will come as a loss to many worthy local causes. Often, when an appeal for funds was necessary on behalf of local charities, his help has been invaluable."

A LONDON TRAFFIC BOARD.

To the Editor of The Tramway and Railway World.

Dear Sir,—I read with interest and appreciation the article entitled "London Traffic Board Wanted," which appeared in your issue of June 17. It is an outspoken statement of the position, which should be carefully read by all interested in the London passenger traffic problem ; and the argument for a co-ordination of the various passenger-traffic services is one which is logically, and should be practically, irresistible. I heartily endorse your dictum that "opposition and competitive hostility are foolish and futile" ; and would further suggest that these are also altogether subversive of the public interest.

Unlike other businesses, competition in passenger transport services does not lead to cheaper rates ; but must, inevitably, sooner or later, mean higher fares. The effect of competition of this kind is merely to divide the sources of revenue ; with the result that neither of the parties are able to give the cheap and efficient service which either of them alone would be able to maintain. A temporary cutting of prices may be the result of such competition, but eventually, if the competition continues, there must be an increase of fares to enable the services to cover working expenses. This is a result now being experienced in London, and it will be more and more felt if the competition is allowed to continue and increase.

It will thus be seen that your assertion, "Co-ordination of all the services, in whatever hands the various sections may be, is imperatively demanded by the need of the whole community," is a simple statement of fact to which the Select Committee on London Transport would be well advised to give special attention.

If, when the new Ministry of Ways and Communications is established, it will apply itself to sweeping away all unnecessary overlapping and competition, this would go a long way towards securing for London such efficiency of service and cheapness of fares as are even now being provided in Glasgow and other large provincial cities.

Yours faithfully,

Tramway Offices, Chingford Road, Walthamstow, *June* 23, 1919. Wm. Murray.

LONDON TRAMWAY BILL.

In the House of Commons on July 10, Mr. Vaughan-Davies moved that the resolution of the Select Committee on Standing Orders of May 28 with respect to the London County Council (Tramways and Improvements) (Petition for Bill) should be referred back to the committee, and that they should have power to inquire whether there were any special circumstances which rendered it just and expedient that the Standing Orders should be dispensed with in respect of Part V. of the Bill referred to in the petition and the provisions relating thereto. Mr. Vaughan-Davies said he had objected to provisions affecting the area outside the County Council area of London, but these objectionable features had now been withdrawn, and the County Council were now simply asking for powers within their own area and affecting their own omnibus arrangements. The motion was agreed to.

TRAMWAYS AND LIGHT RAILWAYS ASSOCIATION.

The journal of the association for July contains the formal notice of the ordinary general meeting of the association, which will be held at 2.30 p.m. on Friday, July 25, at Caxton Hall, S.W. Following the annual meeting papers will be read by Mr. W. L. Madgen on "Tramway Fares and Services," and by Mr. Harry England on "Post War Conditions and Their Effect upon Tramway Undertakings." The annual dinner will be held at 7.30 at the Connaught Rooms, Kingsway, W.C., and applications should be sent to the Secretary, Sanctuary House, 33, Tothill Street, S.W.1.

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MR. CHARLES CHALLENGER.

Mr. Charles Challenger has resigned the position of manager of the Bristol Tramways and Carriage Company, and has been appointed a director of the company. Mr. Challenger, whose experience goes back to the early days of tramways, is 67 years of age, but he is still so active that his many friends will learn with some surprise of his retirement. Born at Clutton, Somerset, he began his business career with the Bristol and North Somerset Railway, then under construction, and in 1869 secured an appointment in the passenger department of the Midland Railway on the opening of that company's line to Bath. In 1873 he transferred to the service of the London and South Western Railway and was stationed in London, where he saw the first tramway car run on the West Metropolitan Tramways. In 1875 Mr. Challenger left the railway service to take a position with the Bristol Tramways Company, and he was one of the first employees appointed by the late Sir George White, Bart., in conjunction with Sir J. Clifton Robinson, who was the new general manager. Mr. Challenger had charge of the inaugural car instituting the service on August 9, 1875, conveying the Mayor and members of the Corporation. Becoming manager of the Neath and District Tramways in 1879, two years later he was appointed manager to the City of Gloucester Tramways Company.

Returning to the Bristol Company as manager in 1882, this energetic tramwayman took part in the progressive policy of the undertaking which has won for it a foremost place among provincial concerns.

Mr. Charles Challenger,
Manager of Bristol Tramways 1882-1919—Now Appointed a Director.

When Mr. Challenger entered upon his duties as a tramways manager, the horse-car was still in its original form, with platforms two feet wide, and iron vertical spiral stairways leading to the roof. The Bristol company was the first to extend the platform to four feet, and to introduce a convenient stairway, which greatly popularised the cars. Knifeboard seats were subsequently removed and replaced by garden seats. To make unnecessary the irritating method of signalling to the driver to stop by poking him on the head with umbrellas or walking sticks, Mr. Challenger introduced a signal bell at the top of the stairs, and on the introduction of electric cars passenger signal bells were placed at several additional positions outside and inside the cars within easy reach. On the Bristol cars passengers were invited to make free use of the passenger signal bell for the purpose of stopping the car, but under no circumstances are drivers allowed to start on receipt of a passenger signal. This signal is a trembling electric bell, and is easily distinguished from the conductor's signal bell, which has a single sound, and is operated by the usual small hand lever on each platform.

Among other improvements introduced by Mr. Challenger was an automatic rainproof seat, the patent for which secured the second prize at the Tramways and Light Railways Exhibition in 1900 at the Agricultural Hall, London. The Challenger automatic rainproof seat has outlived, it is believed, all the other patent seats then exhibited.

Greatly daring, as was then thought, the directors of the Bristol Tramways Company in 1895 decided to introduce electric traction. About ten years later a petrol motor department was added and motor omnibus services were established, and two years later taxi-cabs and touring chars-a-bancs were introduced. Later, with branches in Bath, Weston-super-Mare, Cheltenham, and Gloucester, the company became the largest commercial motor carrying business in the provinces. With all these changes and developments Mr. Challenger was intimately associated.

In 1911, through the instrumentality of Sir George White, a Bristol branch of the British Red Cross Society was formed, when Mr. Challenger was appointed commandant, and 80 certificated tramway employees made up a detachment known as No. 3, Bristol. Throughout the war this detachment, reduced in numbers by enlistments, did splendid work, never failing to meet the ambulance trains day and night arriving in Bristol. No less than 420 trains reached Bristol, bringing 70,000 wounded and sick soldiers from the battlefields of France, Belgium, and the East.

After the death of Sir George White on November 22, 1916, the only individual associated with the start of the company remaining, except Mr. Challenger, was Mr. Samuel White, J.P., who as chairman efficiently fills the vacancy caused by the death of his brother. Mr. Challenger looks back upon his forty-four years' association with the undertaking with pleasure, and he regards it as a privilege to have served under such able administrators as Sir George White and Mr. Samuel White, both of whom filled successively the positions of secretary, managing director and chairman.

Colonel S. E. Smith, C.B.E., who was Mr. Challenger's able assistant for nearly fifteen years previous to the outbreak of hostilities, has been appointed his successor. Colonel Smith at the beginning of the war rejoined his old battalion, the 6th Territorial Battalion, Gloucester Regiment, as major and second in command of the 2/6th battalion. He was attached to the Royal Flying Corps from May, 1915, and was promoted Lieutenant-Colonel, R.F.C., in May, 1916, and Acting Colonel on the formation of the Royal Air Force on April 1, 1918.

Like his predecessor, Colonel Smith will be supported by Mr. W. G. Verdon Smith as managing director, and Mr. H. F. Cooper as secretary.

CONTRACTS AND ORDERS.

Coventry City Council have been recommended to accept tenders for five new cars at £10,908.

W. T. Henley's Telegraph Works have an order for cable from Birkenhead Corporation at £864.

Preston Corporation Cleansing Department recommend the acceptance of a tender for two electric vehicles at £2,664.

Bolton Tramways Committee have ordered two chassis made by the Associated Equipment Company for their tower wagons.

New Tramcars for Dover.—Dover Corporation have ordered from Dick, Kerr and Company, Limited, three new cars at a cost of £6,000.

Wolverhampton Tramways Committee have accepted the tender of the British Thomson-Houston Company for the supply of four G.E. 249A motors required for renewals.

Wigan Corporation have accepted the tender of the English Electric Company for bodies for three single-deck motor omnibuses; the chassis will be supplied by the Daimler Company.

Birmingham Electricity Committee have recommended the acceptance of the tender of the British Thomson-Houston Company for two 15,000-K.W. turbo-alternators for the new Nechells station.

South Shields Omnibuses.—The Tramways Committee of South Shields Corporation have accepted the tender of the Daimler Company, Coventry, for the supply of two petrol chassis at £950 each.

South Shields Electrics.—The Local Government Board have sanctioned the borrowing by the South Shields Corporation of £1,450 for the provision of a boosting station for the supply of electricity to the Council's electric refuse vehicles

The Woods-Gilbert Rail Remodelling Company, Limited, of 170, Strand, London, W.C., are carrying out another contract with the Isle of Thanet Electric Tramways Company for electrically welding and grinding joints, corrugations, and grooves on their rails.

Scholey and Company, Limited, 56, Victoria Street, Westminster, the licensees and contractors for Sandberg's "In Situ" treatment of rails, have secured contracts with the Corporations of Leeds and Sheffield for treatment of existing tramway rails. As previously reported in our columns, Messrs. Scholey have in hand contracts with the following tramway undertakings:—Croydon, Manchester, London (Metropolitan Electric), Birmingham, Bournemouth, Liverpool, and Glasgow.

New Cars for Portsmouth.—In their report to the Town Council the Tramways Committee of Portsmouth Corporation stated that the following tenders were received for the supply of 12 new cars, namely:—Messrs. Dick, Kerr and Company, complete in accordance with specification, £1,930; the Brush Company, body and truck, £1,410 Delivery of the cars could probably be obtained from Messrs. Dick, Kerr and Company in about three months. They recommended that an order be placed with Messrs. Dick, Kerr and Company for 12 cars complete in accordance with their specification and quotation at the price of £1,930 per car. The report was passed by the Council.

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FINANCIAL REPORTS AND MEETINGS.

THE MELBOURNE TRAMWAYS AND OMNIBUS COMPANY, LIMITED, is to be wound up. It will be remembered that the undertaking has been acquired by the municipal authorities.

CALCUTTA TRAMWAYS COMPANY, LIMITED.—The directors recommend a dividend of 6s. per share, making 8 per cent. for the year, free of income tax, and a carry forward of £22,639.

YORKSHIRE (WEST RIDING) ELECTRIC TRAMWAYS COMPANY.—The directors have decided to pay on July 1 an interim dividend of 3 per cent., being at the rate of 6 per cent. per annum on the 6 per cent. cumulative preference shares for the half year ending June 30, 1919.

GLASGOW CORPORATION TRAMWAYS.—The following is a summary of the revenue and expenditure accounts for the year ended May 31, 1919, with comparative figures for previous years :—

Year ended May 31 ...	1919.	1918.	1917.	1916.	1914.
	£	£	£	£	£
Traffic receipts ...	1,527,511	1,404,110	1,245,507	1,149,264	1,078,691
Sundry receipts ...	3,808	8,525	14,607	8,072	5,156
Total revenue ...	1,531,319	1,412,635	1,260,114	1,157,336	1,083,847
Traffic expenses ...	674,664	527,152	395,736	350,186	332,546
General expenses ...	174,508	156,949	137,816	144,297	134,034
Maintenance and repairs ...	219,509	179,811	143,758	133,659	156,214
Power expenses ...	106,686	86,019	67,231	64,346	53,483
Clydebank bridges ...	1,752	1,132	879	516	—
	1,177,119	951,063	745,420	693,004	676,277
War bonuses	72,869	93,120	92,645	80,438	—
Total expenditure ...	1,249,988	1,044,183	838,065	773,442	676,277
To net revenue ...	281,331	368,452	422,049	383,894	407,570
Interest on investments ...	10,565	8,580	78,637	81,203	64,989
Total	291,896	377,032	500,686	465,097	472,559
DEDUCTIONS—					
Rent of Paisley lines ...	9,755	11,119	8,453	6,700	5,830
Interest on capital ...	—	—	78,846	90,474	82,921
Sinking fund	—	—	114,378	109,614	102,607
Income-tax	83,702	64,405	64,622	39,853	14,057
Parliamentary expenses ...	123	61	98	500	609
Renewal and depreciation	183,543	123,894	73,305	174,408	212,642
Total	277,123	199,479	339,702	421,549	418,666
Surplus to Common Good	14,773	177,553	160,984	43,548	53,893

LEICESTER CORPORATION TRAMWAYS.—In his report for the year ended December 31, 1918, Mr. A. F. Lucas, manager and secretary of Leicester Corporation Tramways, states that there was an increase in passenger receipts of £46,185, owing to the exceptionally good trade in the town and increased fares. The working expenses increased by £45,923, due to increased cost of power supply, war bonuses to employees, and the higher price of materials. The gross profit amounted to £76,409, as compared with £71,065 in the previous year. After deducting interest, sinking fund, income-tax, and war allowances to employees, there is a net credit balance of £16,497. Mr. T. Robert Smith, electrical engineer and manager, states that the increased price of fuel and increased wages have again had an adverse influence on the generating costs. The average cost per unit was ·8794d. A comparison of the results for several previous years is appended :—

	1918.	1917.	1916.	1914.
	£	£	£	£
Traffic revenue	237,821	191,636	175,956	149,664
Other revenue	57,095	52,012	40,315	20,571
Total	294,916	243,648	216,271	170,235
Working expenses	218,506	172,583	152,954	118,607
	76,410	71,065	63,317	51,628
Add Bank interest	—	—	157	—
Reserve fund interest	—	—	—	1,660
Gross balance	76,410	71,065	63,474	53,288
Interest on mortgages, etc. ...	25,171	26,028	25,298	24,010
Redemption of debt	16,383	16,573	16,574	13,765
Income-tax	9,627	7,337	7,401	2,801
Bank interest	98	540	—	207
War allowance, reservists, etc. ...	8,634	11,266	12,044	1,284
Net balance	16,497	9,321	2,157	11,221
	76,410	71,065	63,474	53,288

From statistics given in the reports the following items have been extracted :—

	1918.	1917.	1916.	1914.
Units per car-mile	1·84	1·95	1·96	1·82
Power cost per car-mile	3·732d.	3·203d.	2·574d.	1·480d.
Traffic receipts per track mile ...	£6,258	£5,043	£4,630	£4,045
Traffic receipts per car-mile ...	15·317d.	12·025d.	10·279d.	8·682d.
Expenses per car-mile	14·072d.	10·830d.	8·935d.	6·880d.
Ratio of expenses to revenue ...	70%	70%	71%	69%
Total track mileage	38	38	38	38
Number of cars in stock	160	160	160	160

CORK ELECTRIC TRAMWAYS AND LIGHTING COMPANY, LIMITED.—In their report for the year, the directors recommend that the balance of £3,649 remaining after paying dividend on preference shares, and making allowance for depreciations, etc., should be carried forward.

RANGOON ELECTRIC TRAMWAY AND SUPPLY COMPANY, LIMITED.—Gross profits and interest on investments, £80,573, from which a balance of £13,297 remains, after deducting interest on debentures, renewals, allowances, preference dividend, etc. The directors recommend a dividend of 5 per cent. for the year, free of income tax, and carrying forward £4,447.

BOLTON GETS £14,000 FROM TRAMWAYS.—On the report of the Tramways Committee, granting £14,000 from the tramway profits in relief of rates, submitted to Bolton Town Council, it was moved that the matter be referred back, because it seemed unfair to the department. Councillor Horrocks, on behalf of the Tramways Committee, defended the proposal, stating that Bolton tramways undertaking could well afford to make the grant.

TRAMWAYS (M.E.T.) OMNIBUS COMPANY shows a profit—after providing for debenture and loan interest, placing £6,373 to debenture redemption fund and writing off preliminary expenditure, £4,385—of £35,028. Including £1,028 brought forward there is an available sum of £36,056. A dividend of 2s. per share has been declared, and £15,000 has been transferred to reserve, leaving £10,053. In 1907 the dividend was 4s. per share.

BIRMINGHAM DISTRICT POWER AND TRACTION COMPANY.—The net revenue for the past year from the tramways and from investments amounted to £96,672. After deducting administration and general expenses, payment to local authorities and employees' benefit fund, etc., there was a surplus of £79,185. The reserve is increased by £6,297, and the dividend on the ordinary shares is to be raised from 5 per cent. to 6 per cent. The carry forward is a trifle lower at £6,030. The debenture trustees have purchased and cancelled £8,672 of debenture stock, and £40,000 second debenture stock was issued during the year for the purpose of assisting the financial arrangements of the Shropshire, Worcestershire, and Staffordshire Electric Power Companies, in which the Birmingham company have large investments.

MANCHESTER CORPORATION TRAMWAYS.—The following is a summary of the Manchester tramway results for the year ended March 31, 1919, compared with the four preceding years :—

Year ended March 31.	1919.	1918.	1917.	1916.	1915.
	£	£	£	£	£
Traffic revenue ...	1,359,391	1,108,165	965,829	925,301	887,763
Miscellaneous	9,774	9,811	9,809	9,680	9,687
Motor omnibuses ...	210	1,563	158	1,083	786
Parcels	234	323	2,881	3,405	3,639
Total	1,369,609	1,119,862	978,677	939,469	901,875
Traffic expenses ...	295,541	282,550	275,283	261,689	273,002
General expenses ...	98,249	89,615	89,823	88,053	85,809
Repairs and maintenance	133,091	109,155	96,114	81,755	85,280
Power expenses ...	154,521	148,899	137,524	129,942	128,350
War service allowances	287,988	156,936	91,023	92,808	31,764
Total expenditure ...	969,390	787,155	689,767	654,247	604,205
Balance to net revenue	400,219	332,707	288,910	285,222	297,670
Car miles run	18,146,551	18,540,585	18,338,302	18,486,440	19,155,051
Revenue per car-mile	18·114d.	14·496d.	12·773d.	12·197d.	11·3d.
Passengers carried ...	253,940,203	240,914,369	219,151,984	209,877,667	202,768,420

NOTTINGHAM CORPORATION TRAMWAYS.—The following is a summary of the report for the year ended March 31, 1919. For comparison the figures for the three preceding years and for the pre-war year are also set out :—

Year ended March 31.	1919.	1918.	1917.	1916.	1914.
	£	£	£	£	£
Total revenue	307,904	238,867	203,155	195,392	175,379
Working expenses ...	203,916	155,484	138,717	121,266	108,422
Profit on working ...	103,988	83,383	64,438	74,126	66,957
Interest	16,063	16,639	16,495	16,452	14,124
Sinking fund	8,571	8,459	8,459	8,459	8,132
Repayment of loans ...	15,715	15,715	15,715	15,714	12,138
Nottingham Corporation Bill	—	—	—	—	550
Net profit	63,639	42,570	23,769	33,501	32,013
Contributions to rates	30,000	16,000	10,000	20,350	24,000
Reserve fund	33,639	26,570	13,769	13,151	8,013
Passengers carried ...	46,415,421	52,690,881	47,480,934	45,741,208	40,535,874
Fare per passenger ...	1·57d.	1·07d.	1·02d.	1·01d.	1·02d.
Car-mileage	3,572,973	3,776,275	3,766,411	3,885,322	3,543,669
Units per car-mile ...	1·81	1·79	1·70	1·64	1·51
Power cost per car-mile	3·02d.	2·62d.	2·39d.	2·25d.	1·89d.
Receipts per car-mile	20·68d.	15·18d.	12·94d.	12·06d.	11·87d.
Expenses per car-mile	13·70d.	9·88d.	8·44d.	7·49d.	7·34d.
Ratio of expenses ...	66·22%	65·09%	68·28%	62·10%	61·82%
Total track mileage ...	44·25	44·25	44·25	44·25	37·40
Number of cars in stock	155	155	155	155	135

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TRAMWAY AND LIGHT RAILWAY NOTES.

BELFAST.

NEW STANDARD CARS TO BE PURCHASED.

A deputation of the Belfast Tramways Committee have recently visited a number of important tramways and car building works, and on the advice of the manager, Mr. J. S. D. Moffet, they have recommended for adoption as the standard car a four-wheel, double-deck car, having a seating capacity of 26 inside and 42 outside, as against 58 in the present car. Councillor W. C. Turner, chairman of the Tramways Committee, stated to the Town Council that the new car will be more roomy and will have a totally enclosed top saloon and a platform vestibule for the protection of the motorman. The price of the new car will be about three times that of the old car. It will have a larger motor and be designed to take a trailer. The question of the purchase of 50 new cars of the type proposed, at an estimated cost of £130,000, was referred to a special meeting of the Council; and it is now reported that the Corporation has decided to acquire 50 cars at a cost of £2,500 each.

BIRMINGHAM.

PROFITS RESERVED FOR RECONSTRUCTION—QUALITY OF IMPORTED RAILS.

In presenting the report of the Tramways Committee to Birmingham City Council, Mr. F. Smith moved that the Finance Committee be instructed to borrow £125,000, the cost of additional tramcars. In consequence of the increased fares, a satisfactory profit had been made, and the committee suggested that £150,000 should be put to reserve, the greater part of the money to be spent on reconstruction work during the coming year. The report was adopted. Alderman Bewlay enquired whether the American rails had yet been delivered, and if so, whether they had been properly tested mechanically and chemically. Mr. F. Smith replied that a large quantity of the rails have been received, the remainder were on the way, and they had been examined and found to be of first-class quality and up to specification.

CARDIFF.

RETURN OF CARDIFF EMPLOYEES—ADVANCEMENT OF CAR CONDUCTOR.

Mr. Arthur Ellis, general manager and engineer of Cardiff Corporation Tramways, has reported to the committee that over 50 women had been released from tramway service since March 31. Last August 200 women were employed, and the number was now 104. At present 52 of their employees were still with the forces. All men who had enlisted had been found some employment on their return, whether incapacitated or not. In addition, the department were training a considerable number of demobilised men who were not previously in their employ. A number of men with artificial limbs had been tried, but they found that the work was too severe and had been obliged to give it up. Owing to the reduction of hours from 54 to 48 per week, more men were still required for training. A Cardiff car conductor, who for bravery in the field was promoted to a commission, has been granted £500 by the War Office in order that he may be trained as an engineer. He is receiving practical instruction at the Cardiff electricity works, and attends the University College for theoretical training.

DOVER.

OUTSIDE PASSENGERS.

Since the serious accident which occurred on the Dover Corporation Tramways, in 1917, the Board of Trade had forbidden the carrying of outside passengers on the cars. Grave inconvenience has been caused to Dover people and visitors by the restriction, and representations have been made to the Board of Trade showing why the regulation should be abrogated. The result is that the Board of Trade has now sanctioned the carrying of outside passengers on the Dover tramcars.

DUNDEE.

COST OF CURRENT—THE PENALTY OF A CLEAN FACE.

Mr. G. A. Johnston, convener of the Dundee Tramways Committee, has stated that a new arrangement has been made with the Electricity Committee, under which the tramways department will take over the up-keep of the overhead equipment and pay 1¼d. per unit instead of 1½d. as previously proposed by the Electricity Committee. Dundee Corporation Tramway Committee is encountering the difficulties inherent in their system of workmen's fares, which differentiates between the workman (so-called) and the clerk. A printer's delay in supplying the necessary tickets has aggravated the trouble, but a correspondent of the *Dundee Advertiser*, in reporting an interview with a tramway official on the subject, summed up the problem with the remark, "It certainly seems a pity that one should be penalised for having a clean face."

EDINBURGH.

FREE PASSES TO TOWN COUNCILLORS ONLY—TRAMWAY BUSINESS—PROPOSED SCALE OF FARES—LADY COUNCILLOR DEFENDS WOMEN CONDUCTORS.

Edinburgh Town Council has decided that all members of the Council shall be granted free passes on the Corporation tramways. Applications for a similar privilege were received from Edinburgh Parish Council, from the managers and proprietors of theatres in the city, and others, but all applications were refused. The Council remitted to a sub-committee the fixing of routes and fares. In connection with the motor omnibuses, it was suggested that in the event of the Tramway Committee being unable to proceed with the tramway extension to Corstorphine, motor omnibuses should be put on the route, but as the Corporation would have to obtain powers to run motor omnibuses over the route, it was decided to take no action at present. At a meeting held on June 4, the Tramway Committee considered and approved a revised scale of car fares. Instead of the present minimum fare of 1½d. for a mile, a penny stage of 1,442 yards is proposed. This will leave the 1½d. transfer, the 2d. and 3d. fares precisely as they are. Children and workmen will travel at half-fare, but the minimum for the latter is 1d. The committee decided to apply to the Board of Trade for power to introduce penny stages of less than the statutory mile. At a meeting of the Town Council, the only lady member took the view that while it was only fit and proper for women conductors to give up their jobs to ex-tramway workers who are now demobilised, it was a different thing when women were asked to give up their places to boys of 18 or older men who had never been in the tramway service. She considered that an injustice to the women. She thought also that the women were unfairly treated as regards pay. On appointment a woman conductor receives £2 10s., rising to £2 15s. 3d. after 18 months' service. Men, on the other hand, received £3 0s. 6d. on appointment, rising to £3 5s. 6d. after 18 months' service. This is on a basis of 48 hours working week both for men and women. The Tramways Committee promised to consider the appointment of women conductors on the tramway system at an early date.

GLASGOW.

NEW CARS BUILDING—AMERICAN RAILS—CARS DAMAGED BY STORM—GOVAN TRAMWAYMEN HONOURED.

The tramway car works of Glasgow Corporation are turning out a new car every week. The Glasgow Corporation Tramways Department has accepted a tender for 5,000 tons of tramway rails from the United States Steel Products Company. The company has promised earlier delivery than Scottish or English firms could guarantee. The price is £17 9s. per ton, while the lowest British offer was £19 1s. 3d. per ton. A thunderstorm causing the heaviest rainfall on record (2·30 in. within 4 hours and 45 minutes) raged for several hours in the Glasgow district on June 12. The tramway service was interrupted between 7 and 9 o'clock, but serious delays were caused on only three routes, where a number of cars were derailed and had to be withdrawn to the shops for repairs. The difficulty occurred mainly where there was a dip in the track, particularly under railway bridges, sand and dirt being washed into the grooves of the rails and the points blocked, but the water subsided rapidly after the rain ceased, and little permanent damage was done. At the Govan tramway depot of the Glasgow Corporation Tramways, Mr. James Dalrymple, the general manager, recently presented gold watches, on behalf of the Govan employees, to five Govan men who had won military honours. These recipients were: Messrs. H. A. Herd, D.C.M.; J. Anderson, M.M.; W. Borthwick, M.M.; J. Gemmill, M.M.; and J. Malcolm, M.M. Another employee, conductor Jas. Young—who was awarded the Russian Order of St. Stanislaus—has since died, and a gold watch was presented to his son.

GLOUCESTER.

CHARGES FOR SPECIAL CARS.

At the recent meeting of the Electricity and Light Railways Committee of Gloucester City Council, the general manager of the tramways department brought forward the question of the charges which should be made for special cars, and asked for the committee's instructions. The committee decided to increase the charge per car from 20s. to 30s. when used for adults, and from 10s. to 15s. when used for school children, travelling within the city, and from 12s. to 20s. when used for school children travelling beyond the city boundary.

GREENOCK.

TRAMWAY EXTENSIONS.

The Greenock and Port Glasgow Tramways Company desires to extend its system to cope with the anticipated future industrial development and the present need for increased facilities. Particulars have been given to the Greenock, Gourock and Port Glasgow Corporations of the plans proposed. It is intended to extend the line by one mile at Langbank and in Greenock to make a junction from West Blackhall Street to Nicolson Street along Inverkip Road, and later from Greenock West Railway Station east to Wellingburn Street and Rue-End Street. As an alternative, the proposal is to have a track from Wellingburn Street through Regent and Lynedoch Streets and Drumfrochar Road. The line at Gourock it is proposed to extend to a point near Cloch Lighthouse. The company adds that it is obvious the extensions could not be carried out without an extension of the conditions of the lease, which expires in 1928.

LANARKSHIRE.

PENALTY FOR CARELESS DRIVING.

In December, 1918, a tramcar belonging to the Lanarkshire Tramways Company ran into a two-horse lorry conveying mineral waters from Hamilton to Glasgow, killing one of the horses and

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injuring the driver. The man sued the company for £1,000 damages, and Lord Anderson, in the Court of Session, awarded the pursuer £650 for personal injuries.

LEICESTER.

FREE PASSES—FATAL FALL FROM TOWER WAGON.

In 1918, 157 passes were issued by the Leicester Corporation Tramways Committee to the blind and 92 to the crippled. Non-commissioned officers and men of H.M. forces in uniform are allowed to ride on the Leicester cars at half fares and wounded soldiers are carried free. A superintendent wireman of the Leicester tramways, who was at work on the platform of a tower wagon putting in a new wire, was fatally injured by falling to the road. At the inquest it was stated that the deceased had been connected with the tramways for 15 years. There were two men on the platform, 18 ft. from the ground, and as they were putting in a new length of wire the old wire broke, striking them. The deceased fell over the guard and was picked up unconscious. A wireman who gave evidence stated that he had never known a wire to break in the same way before.

LONDON.

PASSENGER FINED—CONSULTING LOCAL AUTHORITIES—SOUTH LONDON TRAMWAY CONDUCTORS—POLICY OF TRAMWAY WORKERS' UNION.

At Stratford Police Court, a Walthamstow man was fined 10s. for alighting from a car by other than the conductor's platform at the rear. It was argued by the defendant that, as the car had reached the terminus, the front of the car automatically became the rear end, but the magistrates did not admit the plea. At Uxbridge Rural District Council meeting a letter was read from the London United Electric Tramways Company, stating that improvements on the system were being made, and that criticisms and suggestions of a constructive character regarding the tramways in the Council's area would be greatly esteemed. A meeting of the South London tramway conductors and demobilised soldiers protested against the continued employment of women conductors by the London County Council, as it was alleged that there are demobilised men waiting for the jobs. It was stated that during the war 1,500 women were employed on the cars and that 500 of these are still retained. As the women belong to the Union and Scotland Yard are said to be still issuing licences, the matter is not so simple as the men seem to think. Mr. Stanley Hirst, general secretary of the Tramway and Vehicle Workers' Union, has stated that the amalgamation of that body with the London and Provincial Vehicle Workers' Union makes the united membership 80,000. Mr. Hirst has been appointed general secretary of the combined body. One of the first steps will be the application for a minimum wage of £3 15s. per week for all tramway men. It will be the policy of every union attached to the Transport Workers' Federation to avoid indulging in idle threats of strikes, but as far as possible to attain their ends by negotiations in order to preserve industrial peace

MANCHESTER.

SUNDAY TRAFFIC—WOMEN'S TRAMWAY WORK—NEW CARS AND METHODS.

A record in Sunday travelling on Manchester tramways was established on Sunday, June 15, when receipts amounted to over £3,900. Tramway managers have their own opinions of the relative value of female as compared with male labour in tramway operation, but they mostly prefer to keep their opinions to themselves. Mr. McElroy, general manager of Manchester Corporation Tramways, has put aside inappropriate scruples, and in giving evidence to the Committee on Women in Industry exhibited the actual facts of his experience without bias. In conclusion he stated that while acknowledging that the municipal tramways could not have "carried on" without the women, he regretted he could not find one point in which they were superior to men for tramway work. The general manager recently stated that there were 100 new cars under construction. Fifty were being built in the Corporation's own shops and 50 were being built by manufacturers. There were difficulties in the way of early delivery, owing to the shortage of iron and steel. The new cars would have vestibule ends and the whole of the tops would be covered in. Asked whether he thought that vestibule ends would increase the number of accidents, Mr. McElroy said that weighing everything, the balance was in favour of making it possible for the drivers to work in comfort. They had experimented with a car specially built to enable passengers to get on at the back end and get off at the front end on the pavement side. They found that the public did not like it, so they had given up the idea. They were not satisfied with the queue system, and they hoped in the near future to have properly constructed tramway terminals, almost like little stations, where passengers could wait under cover in comfort.

NEWCASTLE-ON-TYNE.

WOMAN EMPLOYEES.

Since the demobilisation the number of women employed on the Newcastle cars has been reduced from 400 to 250. All the men have returned from the forces with the exception of about 100, who have not yet been demobilised. The Newcastle branch of the Amalgamated Society of Tramway and Vehicle Workers have passed a resolution demanding that all women who now occupy positions held by men prior to the war be dispensed with. Every tramway worker, however, who has returned from service with the colours has been given a position, and the employees have evidently misunderstood the facts. Many of the women have done good service on the cars since April, 1915.

NOTTINGHAM.

IMPROVED TRAMWAY SERVICE.

There has been a further extension of the Nottingham tramway service at night, and pre-war hours have now been practically re-established. Sunday services are, however, to remain as at present.

OLDHAM.

PASSENGERS' RISKS.

An Oldham tramcar starting at a junction, jerked on the points, throwing down a passenger, who claimed damages for injuries. At Oldham County Court, Judge Spencer Hogg held that the passenger had been given reasonable time to get on the car, and that there had been no negligence by the Corporation.

PAISLEY.

INCREASE OF FARES.—TOWN COUNCIL OBJECT.

Paisley Tramways Company have applied to the Board of Trade for permission to increase fares. It is proposed to abolish the ½d. fare and to make the minimum fare for children 1d. On Sundays and holidays, when increased pay is to be given to the employees, it is proposed to increase the fares by one half, with a minimum of 1d. Paisley Town Council have decided to oppose the increase of fares proposed by the Company.

PRESTON.

ACCIDENT TO A WOMAN CONDUCTOR.

A singular accident occurred to a woman conductor on the Preston tramways recently. When changing the trolley of a car the tension springs lifted her off the ground. When she was about 3 ft. in the air the trolley rope broke, and she fell to the ground, injuring her back; but she was able to proceed to her home. This accident resulted in a deputation from the tramwaymen's union requesting that the Tramways Committee should no longer employ women conductors. The committee has recommended that suitable notice should be given to the women so as to enable them to obtain other employment.

SHEFFIELD.

HOLIDAY OMNIBUS TRAFFIC.

A notable feature of the heavy Whitsuntide traffic in the Sheffield district was the large use which was made of motor omnibuses and, in fact, motor vehicles of every description. As the *Sheffield Telegraph* aptly described it, "any old thing on wheels was brought into service for the holidays," and chars-a-bancs in private ownership were to be seen on all the main roads in the district making their way into the beautiful parts of Derbyshire. The Sheffield Corporation motor omnibuses rendered a largely increased service, ten new vehicles having been obtained during the past few weeks, and the receipts for the four days, Saturday to Tuesday, amounted to £1,569. There is no doubt that given a reasonable price for petrol, which would reduce the working costs by 3d. per mile, there is a great amount of work to be done in the Sheffield districts by the extension of motor omnibus routes from the tramway terminal points to the outlying districts.

SOUTHEND-ON-SEA.

A DILATORY COMMITTEE.

At a previous meeting of Southend District Council, it had been remitted to the Light Railways and Electric Committee of the Council to investigate proposals for three new routes of service in the borough. The committee reported to the recent meeting of the Council that the expenditure involved in the proposals was too great, but that, in the meantime, they had instructed the acting surveyor of the borough to communicate with Essex County Council, asking if they would assist the Corporation to widen a street which abuts upon the land belonging to them.

SWANSEA.

CENSUS OF TRAMWAY PASSENGERS.

The proposal to take a census of the tramway company's passengers, brought forward at Swansea, has been referred back to the committee by the Town Council. Several councillors described the proposal as a waste of money, because the information was useless for any practical purpose.

WALLASEY.

A TRAMWAY STRIKE AVERTED.

After a long conference with the representatives of the employees, the threatened strike of Wallasey tramwaymen was averted. It was decided that a youth who had been dismissed should not be reinstated, and that the question as to hours of duty should receive prompt attention. The terms of the settlement also include a provision that in the event of a deputation appearing before the general manager, the employees shall have the right to appeal to the Tramways Committee, provided that the subject matter of the appeal shall be first submitted to the chief officials of the Amalgamated Society of Tramway and Vehicle Workers. The Tramways Committee has undertaken to consider the formation of a Works Committee in accordance with the Whitley scheme.

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DIARY OF THE MONTH.

MONDAY, JUNE 2, TO MONDAY, JUNE 30.

MONDAY, JUNE 2.

Dover Corporation Tramways Committee resolve to resume top-deck service on River route, suspended by order of the Board of Trade, owing to an accident, since 1917.—General Purposes Committee of West Bromwich Town Council report that the Tramways Company has given notice of discontinuing halfpenny fares.—Select Committee on London Traffic meet at the House of Commons and elect Mr. Kennedy Jones as chairman.

TUESDAY, JUNE 3.

London County Council decide to reintroduce children's fares on the tramways on July 1.—Employees of Societa Romana, in Rome, strike work as a protest against the use of defective vehicles, one of which had directly caused a serious accident.—Leeds City Council increase the salary of the general manager of the tramways to £1,500 per annum.—Chesterfield Borough Council instructs the borough surveyor to report on the street improvements necessary for establishing an omnibus service between Whittington Moor tram terminus and New Whittington; the Council fix ½d. per omnibus mile as payment to Whittington and Newbold District Council for road maintenance on the omnibus route between Newbold and the Brushes.—Swindon Town Council decides, by the casting vote of the mayor, to resume Sunday tramway services.—Birmingham City Council instructs the Finance Committee to borrow £125,000, the cost of additional tramcars.

WEDNESDAY, JUNE 4.

Edinburgh Town Council Tramways Committee revise proposed scale of fares, and agree to apply to the Board of Trade for power to introduce penny stages of approximately three-quarters of a mile.—Sir Auckland Geddes informs the House of Commons that the Government undertakes to help local authorities to utilise army lorries for the public advantage, and that the Government has no immediate intention of taking over control of the tramway and omnibus services within the metropolitan area, as had been suggested.—Sale of surplus army lorries held at Catford, realising nearly £50,000.—Plymouth Town Council Tramways Committee make arrangements for the appointment of a tramway manager.

THURSDAY, JUNE 5.

Dewsbury Corporation approves of the proposal submitted by a conference of the municipalities interested for the establishment of a through tramway route between Dewsbury and Leeds.—High prices are obtained at the second day's sale of surplus army lorries at the Mechanical Transport Depot, Catford; overhauled Hallford lorries of 30 cwt. making from 475 to 600 guineas each.—At the meeting of the Select Committee of the House of Commons appointed to inquire into London traffic conditions, Mr. Arthur Bassom, Scotland Yard Superintendent of Public Vehicles, and Sir William Marwood, of the Board of Trade, give evidence.

FRIDAY, JUNE 6.

Representatives of Wallasey Corporation and the tramway employees meet in conference and arrive at an agreement, averting a threatened strike.—The general manager, Newcastle Corporation Tramways, receives a letter from the secretary of the Newcastle Branch of the Amalgamated Association of Tramway and Vehicle Workers, demanding the dismissal of all women workers on July 1.

MONDAY, JUNE 9.

Kirkcaldy Town Council approves of the proposal of its Tramway Committee that interpretation of the clauses of the national agreement should, in cases of dispute, be referred, first to the whole Council, and finally to an arbiter appointed by the Chief Industrial Commissioner.—Whitsuntide tramway traffic shows large increases at Leeds, Manchester, Bradford, Wolverhampton, Burnley, Birmingham, York and other towns, while the increases in London and suburbs both in omnibus and tramway traffic is extraordinary.

TUESDAY, JUNE 10.

Yarmouth Town Council decide to drop proposals for doubling the line in Regent Street for the season, because of the veto of frontagers.—Cork Corporation tramway employees postpone a strike through the intervention of the Conciliation Board.—At the Court of Session, in Edinburgh, a van salesman is awarded £500 damages against Glasgow Corporation for injuries sustained by collision with a tramcar.

WEDNESDAY, JUNE 11.

Douglas, Isle of Man, Town Council resolves to suspend privilege tickets to ratepayers entitling them to travel at 33 per cent. under ordinary fares.—Edinburgh Corporation Tramway Committee refuse applications for free passes on the tramcars; the fixing of motor omnibus routes and fares remitted to a sub-committee.—Bolton electricity works are destroyed by fire.—Law and Finance Committee of Greenock Corporation considers proposals from the tramways company for large extensions of the system.

THURSDAY, JUNE 12.

York motorists protest, at a meeting, against the restrictions imposed by Government upon the manufacture of motor spirit.—At London traffic enquiry, Mr. E. L. D. Elliott, assistant commissioner of the Metropolitan Police, and Mr. G. H. Hume, formerly chairman of L.C.C. Highways Committee, are examined.

FRIDAY, JUNE 13.

It is officially announced that Sheffield Corporation propose to start a motor omnibus service between Eckington and the Sheffield Corporation tramway terminus.

SATURDAY, JUNE 14.

A tramway strike at Buenos Ayres takes place, drivers of hackney vehicles joining in.—A great rainstorm sweeps through Glasgow, doing considerable damage to the tramway system.—Braintree Rural District Council approves of plans for a light railway to run from Braintree to Marks Tey.—Wigan Corporation decides to run motor omnibuses as a supplementary service to the tramways.—Inquest is held at Wimbledon on the body of a woman killed in a collision between a commercial motor car and a tramcar, at which the driver of the motor car is censured.—A teacher is charged at Sunderland Police Court with travelling with a workman's ticket, to which it is held he was not entitled.—Burnley Corporation Tramway Committee decide to seek powers to run motor omnibuses between Manchester Road terminus and the terminus of Rossendale tramway system at Loveclough.—Blackpool and Fleetwood Tramroad Company are fined for using a tramcar as a hackney carriage without a licence.

MONDAY, JUNE 16.

Wharfedale residents urge Leeds Corporation to extend their tramway system through the valley.—Edinburgh Town Council adopts the recommendation of the Tramways Committee that 1d. be the minimum fare, and that 1½d. fares be abolished.—Glasgow Corporation Tramways Committee receive an offer for the supply of rails from an American firm which would effect a saving of £10,000 on the transaction.

TUESDAY, JUNE 17.

Liverpool Corporation proposes to experiment with the queue system of marshalling passengers at crowded termini.—Mr. McElroy, general manager of Manchester Corporation Tramways, explains the causes of the congestion on the tramways at the beginning of the week.—Leeds Corporation requests Mr. Hamilton, general manager of the tramways, to report on the question of collecting and delivering parcels over the whole system.—Mr. G. H. Hume is further examined by the Select Committee on London traffic; evidence is also given by Mr. J. Calvert Spensley, assistant valuer of the London County Council, Sir H. Haward, L.C.C. controller, and Mr. A. L. C. Fell, general manager of the L.C.C. Tramways.

WEDNESDAY, JUNE 18.

A man is fined 5s. at Glasgow for pretending to be a tramway official and claiming free rides.—Glasgow Corporation Tramways annual report submitted to the Tramways Committee.—The Mayor of Portsmouth receives a deputation from the Comrades of the Great War Association, asking for employment of men and discharge of women engaged in doing the men's work.—Accrington tramway track is found to be sinking on the line of an old sewer.—Belfast Corporation decides to acquire 50 additional tramcars, at a total cost of £125,000.

THURSDAY, JUNE 19.

Edinburgh Merchant Company protests against installing overhead trolley wires in Princes Street.—Sheriff Moffat, Falkirk, holds that an omnibus company is not responsible for the conduct of passengers.—London United Electric Tramway Company asks for constructive suggestions from Uxbridge Rural District Council in regard to tramway improvements.—Stratford Police Court decides that passengers must alight from the conductor's end of the tramcar. Mr. Fell, general manager of L.C.C. Tramways, continues his evidence before the Select Committee on London traffic.

FRIDAY, JUNE 20.

A passenger obtains £50 damages from the South Metropolitan Tramways Company for injuries caused through the premature starting of a tramcar.—Belfast Recorder refuses the appeal of a tramcar driver convicted of reckless driving.—£650 damages awarded a drayman sueing the Lanarkshire Tramways Company in respect of personal injuries at the Court of Session.

MONDAY, JUNE 23.

At Denbighshire County Council meeting it is reported that a grant of £50,000 has been made by the Road Board to the county for roads and bridges.—A passenger at Lowestoft, who refused to pay a fare as a public protest, is fined £1 by the local magistrates.

TUESDAY, JUNE 24.

Manchester Corporation Tramways annual report submitted to the Tramways Committee.—Select Committee of the House of Commons enquiring into transport problems in the London area receives the evidence of Mr. H. A. Vernet, deputy chairman of the traffic "combine," and Mr. Frank Pick, commercial manager of the group of companies known by that name.

WEDNESDAY, JUNE 25

London United and Metropolitan Electric Tramways resume the issue of children's tickets.—Proposed tramway service between Huddersfield and Brighouse approved by Brighouse Town Council.—Hull Corporation Tramways Committee resolves to promote a Bill in Parliament giving powers to extend the tramways to Hessle, Anlaby, Kirkella, Willerby, Sutton, and Hedon.—The Tramways Committee of Edinburgh Town Council decides to dispense with the services of women conductors.—Glasgow Corporation Tramways Committee recommend acceptance of an offer by the United States Steel Products Company to supply 5,000 tons of steel rails at £17 9s. per ton.—Mr. Frank Pick continues his evidence at London traffic enquiry, and Mr. Vernet, deputy chairman of the "combine," is re-examined on questions of policy.

THURSDAY, JUNE 26.

"Plate Day" at Gosforth Park Race Meeting; receipts on Newcastle Corporation Tramways amount to £4,923 for the day. Mr. E. S. Raynor, manager of Doncaster tramways system, appointed

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general manager of Hull Corporation Tramways, in succession to Mr. McCombe, resigned.—At London Traffic Inquiry, Mr. H. E. Blain, operating manager of the group of companies known as the "Combine," submits evidence.—Stalybridge, Hyde, Mossley, and Duckinfield Tramways Board meet to receive annual report and discuss purchase of Hyde section of the Oldham, Ashton, and Hyde Tramway Company's undertaking.

FRIDAY, JUNE 27.

Lancaster Town Council considers proposals of the Tramway Committee to raise fares and other methods of increasing revenue, so as to put the system on a paying basis.—Halifax Corporation Tramways Committee celebrates the "coming of age" of the tramways.—Persistent obstruction by a lorryman of the tramcars is penalised by a fine of £1 at Sheffield Police Court.

SATURDAY, JUNE 28.

Rural Transport Committee holds a conference at Inverness with Highland Reconstruction Association with regard to light railways.—A breakdown occurs on London Underground, causing an interruption of traffic for two hours.

MONDAY, JUNE 30.

Demobilised men employed by the London Combine welcomed at reception in Albert Hall, Lord George Hamilton presiding.—Explosions in feeder boxes of Sheffield Corporation Tramways cause damage and alarm.—A passenger successfully resists the claim of Belfast Corporation Tramways Department for excess fare.—Reduced rate of fares for children come into operation on London County Council Tramways.—A permanent memorial of the employees of Coventry Corporation Tramways Department who served in the war was unveiled on Sunday.

PERSONAL.

Mr. E. E. Hoadley, electrical engineer of Maidstone, has been granted an increase in salary to £769 per annum.

Mr. F. W. Purse, electrical engineer of Carlisle Corporation, has been appointed engineer and manager to the West Ham Corporation.

Mr. T. A. Kingham, who has been acting electrical engineer of the Kingston-on-Thames Corporation, has been appointed borough electrical engineer.

Messrs. Stephen Sellon and Partners, of 36, Victoria Street, London, S.W., have been appointed engineers to the Dearne District Light Railways Joint Committee, who hold an order for the construction of fifteen miles of light railways in the West Riding of Yorkshire.

Mr. W. T. Robson, general manager and engineer of Southampton Corporation Tramways, has been compelled to resign his position on account of ill-health. The Tramways Committee, in accepting his resignation, have granted him an honorarium, and have placed on record their appreciation of his valuable services in the past, and their great regret that his doctor advises him that he must not remain in the south.

PATENT LIST.

Abstracted for "The Tramway and Railway World" from the Official Journal of Patents.

***** If the inventions have been communicated the names of the communicators are given in italics.**

APPLICATIONS FOR LETTERS PATENT.

The number of the patent is given in brackets.

Steering axles, etc. (13,840)—Andre, Griffith and Charnock and G. M. L. Griffith.
Direction indicators for road vehicles (13,578)—E. Archer.
Air brake systems (13,393)—Automatic Straight Air Brake Co.
Brake mechanism of motor vehicles (13,323)—W. T. Bell and F. J. Bretherton.
Brake operating mechanism for motor vehicles, etc. (13,849)—Bentley Motors, Limited, and W. O. Bentley.
Spring dampers and shock absorbers for motor vehicles (13,850)—Bentley Motors, Limited, and W. O. Bentley.
Tramway rails (13,459)—M. Boden.
Traffic control and ticket systems (13,384)—C. F. Buffard.
Safety locks for automobiles, etc. (13,822)—L. Collins.
Change-speed mechanism (13,394)—J. Farley.
Motor vehicles (13,809)—T. Foulkes.
Emergency system for re-lighting electric tramcars and connecting pulley with overhead wires (13,161)—A. Garner.
Control levers for motor vehicles (13,851)—Humber, Limited, and L. J. Shorter.
Automobile vehicles (13,557)—G. H. Holmes.
Rail anchoring devices (13,350)—W. J. Mellersh-Jackson (*P. and M. Company*).
Rail anchoring or anti-creeping devices (13,520)—W. J. Mellersh-Jackson (*P. and M. Company*).
Automobiles (13,240)—H. Kapferer.
Radiators for internal combustion engines etc. (13,484)—J. Mantanus.
Variable speed power transmission system (13,818)—J. Moorhouse.
Variable speed gear (13,261)—J. Nelson.
Fluid pressure braking apparatus (13,197)—A. W. Rendell.
Composite friction wheels for engines of motor vehicles (13,415)—C. E. Richardson.
Locking devices for motor vehicles (13,392)—H. S. Schroeder.
Wheels for motor vehicles (13,853)—J. D. Siddeley.
Radiators for automobile engines (13,313)—A. Voisin.
Four-wheeled motor vehicles (13,862)—J. Weller and S. B. Weller.
Gear changing device for mechanically propelled vehicles (14,079)—H. J. Andrews.
Automobile signals (14,320)—E. G. Balch.
Transmission gearing (13,928)—Bentley Motors, Limited, and F. T. Burgess.
Automobiles (13,879)—T. Birch.
Electric railways (14,427)—British Westinghouse Electric and Manufacturing Company.
Motor vehicles (14,295)—W. B. Brown.
Power transmission for vehicles (14,088 and 14,089)—Caterpillar Tractors, Limited (*Holt Manufacturing Company*).
Electric signal devices for railways (13,968)—A. H. Childs.
Motor vehicles (14,470)—H. Crochat.
Hand wheels for motor vehicles (14,059)—A. E. Danks.
Steering gear of mechanically propelled vehicles (14,156)—C. S. G. Edmonds.
Means for removing and replacing wheels of heavy motor vehicles (14,461)—J. Glahone.
Epicyclic change speed gear for motor vehicles (14,407)—P. G. Guilford.
Stop-gate and regulator for tramcars, omnibuses, and trains (14,368)—E. Harris.
Steering gear of mechanically propelled vehicles (14,156)—A. B. Hart.
Change-speed gear for motor vehicles (14,252)—J. H. Hooley and W. H. Tate.
Motor car tires (14,039)—J. James.
Safety locking devices for motor vehicles (13,976)—W. King, A. M. Mintram, and C. E. Streatfeild.
Power transmission means with automatic declutching mechanism (14,003)—E. Mayen.
Variable speed friction gear and clutch combined (14,488)—J. S. Phillips.
Method of springing overhead arm of tramcars, etc. (14,432)—H. L. Reilly.
Lifting jacks (14,123)—A. Shrieves and H. E. Shrieves.
Wheels for motor vehicles (14,220)—J. D. Siddeley.
Locking devices for motor vehicles (13,964)—N. Thomas.
Radiators for automobiles (14,176)—D. E. Turner.
Clutches and variable speed gears (14,157)—W. O. Turner.
Fluid pressure braking apparatus (13,947)—Westinghouse Brake Company (*Westinghouse Air Brake Company*).
Covers for laminated springs and steering joints of motor vehicles (14,914)—J. A. Airston, F. Jesson, and E. C. Windle.
Method of preventing starting of motor car engines (14,563 and 14,564)—A. Auer.
Locking device for steering column of motor cars (14,622)—W. S. J. Bailey.
Locking devices for motor vehicles (14,779)—S. H. Blichfeldt and H. Kruse.
Trolley heads for overhead wire systems of electric traction (14,909)—Brecknell, Munro and Rogers and A. M. Willis.
Gear boxes for motor vehicles (14,802)—T. Broadbent.
Prevention of flats on pony wheels of tramcars (14,983)—W. Brown and W. J. Harvey.
Means for preventing manipulation of electric motor vehicles (14,782)—H. Crochat.
Device for locking steering gear and switching off electric current from magnetos of motor cars (14,731)—G. Cummuskey.
Motor vehicles (14,738)—H. Dorrington.
Transmission gear of motor vehicles (14,740)—H. Dorrington.
Continuous air brakes (14,596)—J. Dunlop.
Combined motor and dynamo with dual field control for starting and lighting sets for automobiles (14,617)—E. J. Hawkins.
Motor omnibuses (14,746)—W. J. Hickman.
Motive power vehicles (14,727)—H. W. Houlden.
Driving mechanism for motor vehicles (14,769)—E. J. Kane.
Wheel for motor cars (15,020)—J. Liddle (*I. Haslem*).
Motor vehicles (14,695)—B. Louis.
Means for locking motor vehicles (14,957)—J. D. McIvor.
Lock for steering columns of motor cars (14,920)—A. McKim.
Chain, etc., adjustment for motor cars (14,651)—H. F. Morgan.
Petrol regulator for motor cars (14,701)—A. Tait.
Variable gearing (14,763)—C. W. I. Thomas.
Tramway and railway points or switches (14,796)—F. Tonge.
Mechanism for locking steering wheels and control levers of motor vehicles (15,040)—T. A. Waters.
Automatic feed pumps for motor vehicles (14,828)—W. A. Weaver.
Transmission gear for motor vehicles (14,962)—J. S. Wilkerson.
Detachable disc wheels for motor cars (14,696)—E. E. Willson.
Safety device for electric lighting of tramcars (14,956)—W. Wood (*Wood*).
Springing of motor vehicles (15,207)—A. J. Adams.

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Gear wheel (15,348)—Aktiebolaget Svenska Kugghjulsfabriken.
Shock absorbing devices for motor vehicles (15,329)—B. H. Bayliss.
Spring suspension for automobiles (15,562)—F. W. Berwick and Company and M. H. L. Sizaire.
Friction driving gear for motor vehicles (15,517)—R. Blakoe.
Anti-vibration devices for motor cars (15,131)—A. Brereton.
Electricity collectors (15,521)—British Insulated and Helsby Cables, Limited, and J. W. Astley.
Trolley pole reversing mechanism for overhead electric tramways, etc. (15,643)—J. R. Cooke.
Wheels for motor vehicles (15,430)—Daimler Company and P. Martin.
Steering wheels of motor cars (15,066)—W. Elwood.
Lubricated bearings for axle boxes of rolling stock of railways and tramways (15,345)—G. Eveno.
Motor vehicles (15,362)—W. L. Garrett.
Sparking plug for petrol and gas engines for motor cars (15,658)—A. Greensmith.
Tramway rails (15,595)—J. P. Hitchcock.
Lifeguards for motor vehicles (15,559)—T. A. Hornsey.
Lifting jacks (15,396)—C. F. L. King.
Control switch for motor cars (15,054)—C. H. G. Kingsland and E. W. Walsh.
Shock absorbing devices for motor vehicles (15,236)—D. Levy.
Guard for mechanically propelled vehicles (15,079)—W. Meiklejohn.
Variable speed gear (15,166)—H. L. Ollier and W. Sever.
Locking device for motor cars (15,108)—E. J. Pyke.
Self-propelled vehicles (15,262)—G. H. Welford.
Variable speed gearing (15,308)—G. S. Wilkinson.
Trucks for railway and tramway vehicles (15,796)—W. S. Adams and J. G. Brill Company.

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Road wheels for motor vehicles (16,054)—F. W. Brampton.
Automobiles (15,925)—H. A. Brosseau.
Spring wheels for motor vehicles (15,745)—T. A. Browne.
Indicating device for motor vehicles (16,152)—S. C. Caddy.
Compressors for compressed air brakes mounted on axle boxes (15,871)—J. Cantillon.
Motor vehicles (16,212)—Castle Motor Company and S. Goodwin.
Brake levers for motor vehicles (16,320)—F. C. Denham.
Spring suspension for motor vehicles (16,242, 16,243, and 16,244)—G. Fornaca.
Permanent way for railways (16,069)—J. Grondahl.
Lubrication of motor vehicles (16,057, 16,058, 16,059, 16,060, and 16,061)—S. S. Guy.
Motor vehicles (15,800)—M. F. Huxley.
Life guard for road vehicles (16,167)—G. L. Lavington.
Ignition switches for motor vehicles (16,071)—C. H. Luke.
Sleepers for rails (16,132)—R. Blake (*F. G. A. Pinckney*).
Tramway vehicles (16,197)—W. R. Pike.
Motor vehicles (16,092)—J. G. Schulz.
Tramcars (15,794)—A. W. Truste.

Specifications Published.

1916.

Driving mechanism for heavy mechanically propelled vehicles (15,665—*126,032*)—W. G. Wilson.
Self-propelled vehicles (17,249—*126,075*)—R. F. Macfie.

1917.

Self-propelled vehicles (2,061—*126,686*)—R. F. Macfie.
Electrical signalling systems (2,294—*126,696*)—Sir A. T. Dawson and Sir G. T. Buckham.
Electrical driving gear, particularly for motor cars (2,591—*127,012*)—H. Crochat.
Motor vehicle (3,869—*127,023*)—F. Turnbull.
Pedal control for motor cars (5,671—*127,332*)—T. Antoine.
Motor vehicles (5,696—*127,334*)—W. J. Rusdell.

1918.

Wheel tires for railway and tramway vehicles (7,303—*115,431*)—C. Coda.
Internal expansion brakes (8,213—*117,067*)—T. R. Morse.
Brakes (8,214—*118,087*)—T. R. Morse.
Systems of electric power transmission (10,256—*126,199*)—British Thomson-Houston Company (*General Electric Company*).
Electrical instruments for signalling on railways (13,756—*126,225*)—Tyer and Company and F. W. Leake.
Devices for lubricating the motors of motor road vehicles (7,141—*126,429*)—C. E. Baggs and S. J. Thompson.
Propulsion of motor road vehicles (7,851—*126,466*)—A. S. Applebee.
Motor vehicle for handling motor road vehicle breakdowns (7,853—*126,467*)—A. W. Smyth and J. B. West.
Fenders for automobiles (7,874—*126,468*)—F. F. Benson.
Means for securing flanged rails to sleepers (10,387—*126,522*)—G. Lewis.
Friction change-speed gearing (19,329—*121,123*)—G. M. Barbier.
Power transmission device (8,212—*126,799*)—J. R. Kinney.
Couplers for vehicle running gears (8,443—*126,816*)—G. L. Bumgardner and H. A. Partridge.
Trolley heads of electrically propelled vehicles (8,793—*126,826*)—C. W. Collins.
Supporting and steering devices for the front wheels of motor vehicles (12,673—*126,866*)—P. A. C. Larsen.
Hoisting apparatus for automobiles (18,774—*120,737*)—E. Holmes.
Lifting jacks for motor road vehicles (6,673—*127,074*)—F. L. Rapson.
Shock absorbing mechanism for motor vehicles (7,900—*127,082*)—S. L. C. Coleman.
Trolley heads for electric tramways (8,581—*127,102*)—Wadkin, Mills and Company, A. G. H. Thatcher, and J. G. Small.
Power transmission gearing (13,237—*127,161*)—J. W. Cann.
Method of and apparatus for controlling railway points and signals (20,376—*121,603*)—A. Monard.
Variable speed and reversing gearing (7,265—*127,372*)—G. Linden, A. G. Hojer, and E. O. G. Lundin.
Self-propelled rail vehicles (8,816—*127,399*)—J. D. Abbott and T. D. Abbott.
Devices for placing trolleys on to the overhead conductors of electric tramway systems (10,650—*127,438*)—W. H. Gamble.
Electrically propelled trucks and like vehicles (10,858—*127,441*)—P. A. H. Mossay and Mossay and Company.
Brake shoes (18,181—*127,493*)—F. P. Wilson and D. G. Pennington.
Front axles for motor cars (21,210—*127,513*)—J. R. Churchill.
Apparatus for electrically controlling railway signals (21,407—*127,514*)—A. Monard.

1919

Creep anchors for rails (482—*126,257*)—F. R. Morgan.
Indicators for motor cars (1,707—*126,261*)—E. H. Bryan.
Variable speed and clutch mechanism (1,152—*127,526*)—H. F. Field and S. F. Burgoine.
Power transmission mechanism for railway motor cars (8,718—*127,546*)—Baguley Cars, Limited, and E. E. Baguley.

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TRAFFIC RETURNS.

Tramway and Omnibus Undertakings in the United Kingdom.

NAME OF COMPANY OR CORPORATION.	1918. WEEKS ENDED.					1919. WEEKS ENDED.					AGGREGATE.		
	June 1	June 8	June 15	June 22	June 29	May 31	June 7	June 14	June 21	June 28	Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Aberdare U.D. Council	523	569	461	444	473	...	...	742	638	522	12	6,503	+ 268
Aberdeen Corporation	3,395	...	4,590	2,434	2,480	4,849	...	5,319	3,304	3,198	34	11,822	+ 2,318
Ayr Corporation	519	611	538	603	610	777	717	685	716	706	6	4,126	+ 987
Belfast City Tramways	7,732	8,160	7,151	7,031	6,874	11,350	11,013	10,248	10,395	10 285	13	133.044	+ 34.761
Birkenhead Corporation	2,250	2,163	2,112	2,053	2,210	3,008	2,885	3,341	2,813	2,791	12½	34,323	+ 6,825
Birmingham Corporation	23.744	24.230	23.523	23.644	23.401	26.034	25.967	28.633	25.543	25,496	13	335.744	+ 38.571
Birmingham Motor Buses	1.572	1.610	1.479	1.466	1.537	1,831	1.747	2.476	1.777	1.677	13	22.748	+ 3,369
Blackburn Corporation	1.877	1.981	2.954	...	1,630	2.414	2.483	3.317	2,422	2,240	13½	32.005	+ 8,140
Bradford Corporation	8.483	9.894	9.769	9.168	9.699	11.365	11.731	14.006	11.161	10.977	13	146.991	+ 37,054
Burnley Corporation	2.235	2.198	2.105	2,189	2.200	2.979	3.059	3,650	2.920	3.149	—	—	—
Burton-on-Trent Corporation	400	391	392	400	399	483	501	563	486	472	13	6,146	+ 1.047
Bury Corporation	2.619	2.029	1.953	1.939	2.069	2.499	2.392	2.960	2,529	2.309	12½	31.870	+ 5,775
Chatham and District	1.321	1.484	1 351	1.330	1.349	1.631	1.730	2.057	1,791	1,550	25	35.752	+ 4,378
Cork Electric	737	784	666	653	700	782	848	758	771	733	25	15.456	— 204
Derby Corporation	1.535	1.515	1.508	1.462	1.466	2.089	2.159	2.514	2.062	1.951	13	24.499	+ 5,238
Dundee City	1.940	2.000	1.966	1.860	1.861	2.389	2.438	2.668	2.650	2.523	5⅝	14.576	+ 3.233
East Ham Corporation	1.441	1.557	1.533	1.536	1.516	2.049	2.019	2.221	1.890	1.809	12½	24.698	+ 6,410
Glasgow Corporation	31.072	31.255	28.940	28.819	29.974	35.176	33.912	33.345	32.917	32.880	4	133.055	+ 13,453
Glossop (Urban Elec. Supply Co.)	212	194	174	167	178	226	231	274	256	222	26	5.832	+ 1,092
Halifax Corporation	2.904	2.933	2.612	2,452	2.523	3.563	3.768	5.283	3.802	3.351	12½	44.695	+ 11,152
Halifax Motor Omnibuses	61	63	59	54	58	73	80	116	86	82	12½	1.003	+ 260
Huddersfield Corporation	3.864	3.834	3.409	3.396	3.242	4.813	4.898	6.577	4.768	4.684	13	63.766	+ 15,953
Ilford U.D. Council	998	1.108	993	975	1.023	1.274	1.321	1.547	1.296	1.266	13	16.115	+ 3.554
Ipswich Corporation	767	758	741	702	739	849	1.067	1.258	961	921	13	11.476	+ 2.208
Isle of Thanet	285	285	304	279	288	1.001	554	1,729	1.473	1.389	38½	20.503	+ 12.634
Kilmarnock Corporation	223	232	214	232	235	275	271	275	284	298	6½	1.862	+ 352
Lanarkshire	3.710	4.251	3.696	3.659	3.828	4.204	4.169	4.081	4.069	4.110	25	84.350	— 3.376
Leeds City	12.415	12.300	13.293	13.296	13.807	17.240	17.506	22.125	16.672	16.432	13	218.637	+ 62.501
Leicester Corporation	4.613	4.743	4.542	4.463	4.540	5.983	6.210	7.354	5.987	5.792	—	—	—
Leyton U.D. Council	2.114	2.297	2.218	2,130	2.198	3.233	3.342	4.097	3.259	3,100	13	41.121	+ 14.020
Liverpool Corporation	18.888	19.444	18.116	18.159	18.892	23.360	23.733	25.603	23.473	22.785	25½	552.554	+ 105,459
London County Council	63.414	67.109	65.304	64.508	64.910	82.946	84.441	92.615	82.983	80.575	12½	997.004	+ 242.507
Maidstone Corporation	254	287	260	248	268	355	376	463	375	352	12½	4.793	+ 1,266
Manchester Corporation	24.366	26.581	24.764	25.023	25.025	30.947	31.099	33.974	31.792	30.305	13	395.995	+ 73.279
Newcastle-on-Tyne Corporation	9.205	9.440	9.159	9.099	9.163	9.575	9.470	10.242	9.183	15,917	13	125.251	+ 9,910
New St. Helens and District	...	...	...	...	...	...	...	...	...	...	—	—	—
Northampton Corporation	825	834	848	812	801	1.288	1.320	1.836	1.290	1.212	13	16.631	+ 5.268
Nottingham Corporation	5.811	6.081	5.917	5.931	5.857	7.096	7.230	8.667	7.039	6.844	13	90.122	+ 17.224
Oldham Corporation	4:272	3.419	3.364	3.444	3.435	4.931	4.755	5.186	4.769	4.373	14	61.475	+ 13,067
Reading Corporation	1.302	1.362	1,324	1.253	1.312	1,634	1.602	1.936	1,688	1.569	12⅜	19.828	+ 4.039
Rhondda Tramways	...	...	...	...	...	...	...	...	...	...	—	—	—
Rotherham Corporation	2.111	2.063	2.106	2.317	2.287	2.261	2.668	2.352	2.034	2.084	13⅜	30.496	+ 2.018
Sheffield Corporation	13.942	13.589	13.655	13.296	13.234	17.213	17.040	19.224	16.524	16.399	13⅜	233.725	+ 48.571
Southampton Corporation	2.468	2.582	2.476	2.439	2.561	2.773	2.821	3.292	2.607	2.677	12⅜	34.020	+ 2.938
Southend-on-Sea Corporation	964	1.147	1.089	1.113	1.148	1.957	2.114	3.388	2,640	2.404	13	24.957	+ 12.909
South Shields Corporation	1.146	1.163	1.129	...	...	1.413	1.422	1.467	...	...	11	15.057	+ 3.121
Sunderland Corporation	2.089	2.030	2.001	2.009	2.148	2.948	3.047	3.721	2,845	2.895	13	37.873	+ 10.683
Swindon Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
Torquay Tramways	894	942	874	862	936	1.139	1.157	1.451	1.253	1.164	25	23.349	+ 3,761
Tyneside Tramways and Tramroads	1.119	1.273	1.165	1.042	...	1.220	1.131	1.522	1.132	...	25	23.539	+ 28
Wallasey Corporation	1.934	2.005	1.770	1.740	1.912	2.644	2.583	3.306	2.659	2.485	12⅜	32.765	+ 9.581
Walsall Corporation	1.154	1.201	1.170	1.170	1.192	1.359	1.387	1.814	1.288	1.298	13	18.255	+ 2,537
Walthamstow U.D. Council	1.550	1.702	1.518	1.457	1.583	1.858	1.896	2.349	1.817	1.677	13	23.534	+ 4.915
Warrington Corporation	742	742	705	722	726	862	904	961	877	851	12	11.158	+ 1,962
West Ham Corporation	4.183	4.528	4.377	4.288	4.287	5.745	5.895	6.697	5.752	5.446	12⅜	70.223	+ 17.163
Wolverhampton Corporation	1.717	1.670	1.672	1.721	1.654	2.019	2.981	1,999	1.875	1.862	13	27.028	+ 3.989

*** A number of undertakings suspended the issue of traffic returns for the duration of the war.

Colonial and Foreign Tramway Traffic Returns.

NAME OF COMPANY.	1918. WEEKS ENDED.					1919. WEEKS ENDED					AGGREGATE.		
	June 1	June 8	June 15	June 22	June 29	May 31	June 7	June 14	June 21	June 28	Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Anglo-Argentine	54,989	55.495	56.754	55.314	50,966	65,786	21.250	22,535	38,580	56,145	25	1,369,551	— 11,407
Calcutta Rs.	...	72,740	72.468	...	...	...	80,143	82.650	...	...	—	—	—
Madras Rs.	41,152	(2 weeks)	39.261	(2 weeks)	40.270	45.875	(2 weeks)	44.626	weeks)	44.349	26	453.043	— 30,367
Pernambuco	4,082	4,409	4.393	4,539	4,204	5,605	5,391	5,763	5,642	5.351	25½	140,340	+ 23,022

Companies issuing Monthly Statements only.

	1918.						1919.						Wks.	AGGREGATE.	
	Jan.	Feb.	March.	April.	May.	June	Jan.	Feb.	March.	April.	May.	June		1918-19.	+ or —.
	£	£	£	£	£	£	£	£	£	£	£	£		£	£
Ballarat & Bendigo	4.505	3.573	3,803	4.095	...	...	4.504	3,602	3,051	4.291	...	...	4	4,291	+ 196
Brazilian Trac. Mlrs	7837000	7315000	8094000	8330000	...	...	8522000	7972000	9330000	9208000	...	...	17	35.032,000	+ 3,456,000
Brisbane	34,500	32.009	35,530	35.530	...	...	38,575	34.380	39.380	38.775	...	...	17	151.110	+ 13.541
British Columbia $	559,569	501.150	510,892	515,417	486,876	...	667.489	645.415	649,120	631.988	628,947	...	48	6.650,954	+ 1,153,390
Buenos Ayres L'c'z.	38,902	34.397	42.647	41,643	41,315	38.375	41,556	42,429	47,370	43,607	47.317	61,356	52	542,859	+ 75,101
Burma	25,430	22,985	27,906	27.614	29.019	...	38.265	35,926	38.440	36.815	38.900	...	43	364,885	+ 96,111
Cape Town	...	...	...	19,011	...	...	...	...	...	22,564	23.405	...	—	—	—
Carthagena & H.	4.011	4.031	5.316	4.200	5.027	5,047	3.655	2.351	2,400	1,786	3,226	3.373	26	16,791	— 10.841
Cordoba	12,844	12.972	...	...	...	...	13.942	13.549	...	...	...	...	48	159.203	+ 11.492
East India	1.176	1.318	1,729	1.791	1,920	...	1,970	1.689	2,016	1,920	2,131	...	43	19,679	+ 5,472
Kalgoorlie	2.522	2.373	...	...	...	...	2.562	2.278	...	...	...	...	8	4.840	— 55
La Plata	4.711	4.746	5.348	5.169	5,105	...	5.730	5.698	6.592	5,630	5.702	...	22	29.352	+ 4,274
Lima	43.561	41,921	42.076	43.557	...	...	45.362	46.082	50,716	49,968	...	...	17	92,631	+ 10.652
Manaos Rs.	...	...	...	...	...	...	...	...	...	...	...	...	—	—	—
Manila $	167,000	168.000	172.750	163.500	...	...	231.585	211.368	207,792	212,638	...	...	17	863.383	+ 192,133
Monte Video	36.016	34.573	36,659	33.704	32,301	...	40.910	38.772	41.070	37,014	37,382	...	31	265.287	+ 26.949
Peruvian $	1189350	925.410	...	...	...	...	1009650	943.470	...	...	...	...	34	7,973.835	— 229,195
Para	24,060	22.198	24,848	24.745	24,925	...	24,515	23.248	26,022	25.342	24.503	...	26	147.430	+ 3,339
Port Elizabeth	...	...	...	4.028	...	...	...	...	...	5,576	5.145	...	—	—	—
Rangoon	5.361	5.662	5.955	5.885	5.719	6,163	6.373	5.694	7.533	6.217	6.533	6,276	26	38.626	+ 927
Toronto $	1068319	981.933	1113472	1065766	1090747	...	1106840	1015797	1083285	1051960	1032717	...	48	5,290,599	— 29,638
Winnipeg $	334.642	298.899	307.289	...	280,935	...	390.539	371.162	384.937	...	248.191	...	—	—	—

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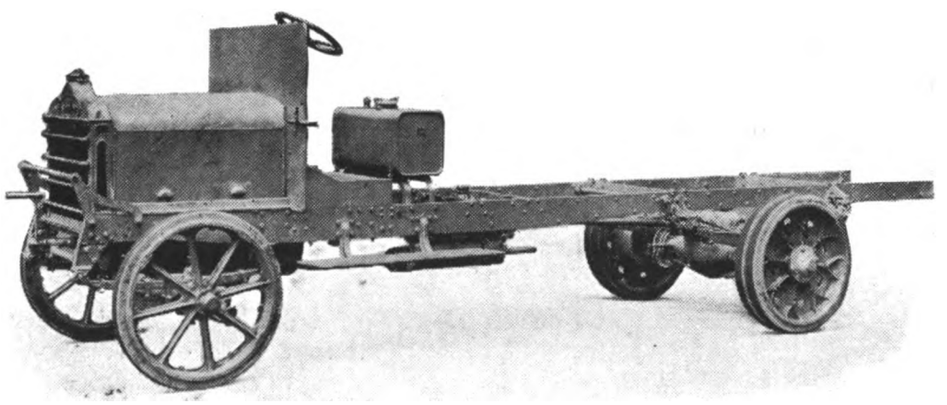

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¶ Napiers Business Vehicle Dept. have decided to concentrate their efforts for the 1919/1920 season on one Model--the Two-ton. The following are the main points in the specification—

SPECIFICATION

ENGINE—4-cylinder, 25-30 h.p., bore 3 1/8 ins. (94 mm.), stroke 5 ins. (127 mm.)
IGNITION—H.T. Magneto
GEAR BOX—4 speeds forward and reverse
CLUTCH—Single disc type with hardened steel disc
TRANSMISSION—Live axle
FRAME—Channel section pressed steel 6 ins. deep, 2 ins. wide, complete with towing hooks
BRAKES—Foot brake on the main shaft. Hand brake internal expanding type, on brake drums of rear hubs
SPRINGING Semi-elliptical type, long and flexible, and of ample strength for load to be carried
PETROL CAPACITY—12 gallons
ROAD WHEELS—Splendid cast steel, roller bearings
TYRES—Dunlop, front 870 x 100 (100 for 720) single; Dunlop, rear 870 x 100 (100 for 720) twin

Complete Tool Kit, Front Wings, 5 Lamp Brackets, and Plates for Registered Numbers

PRINCIPAL DIMENSIONS

Wheelbase	10 ft. 6 in.
Dash to centre of back wheel	8 ft. 11½ in.
Dash to end of frame	13 ft. 5 in.
Width of chassis frame	32 in.
Overall Width	6 ft. 5½ in.
Overall length	16 ft. 5 in.
Ground Clearance	10½ in.
Turning circle (approximately)	44 ft.

WEIGHTS

Chassis Weight	2 tons
Average weight of body	¾ ,,
Net weight of load	2 ,,
Gross loaded weight of vehicle not to exceed	4¾ tons

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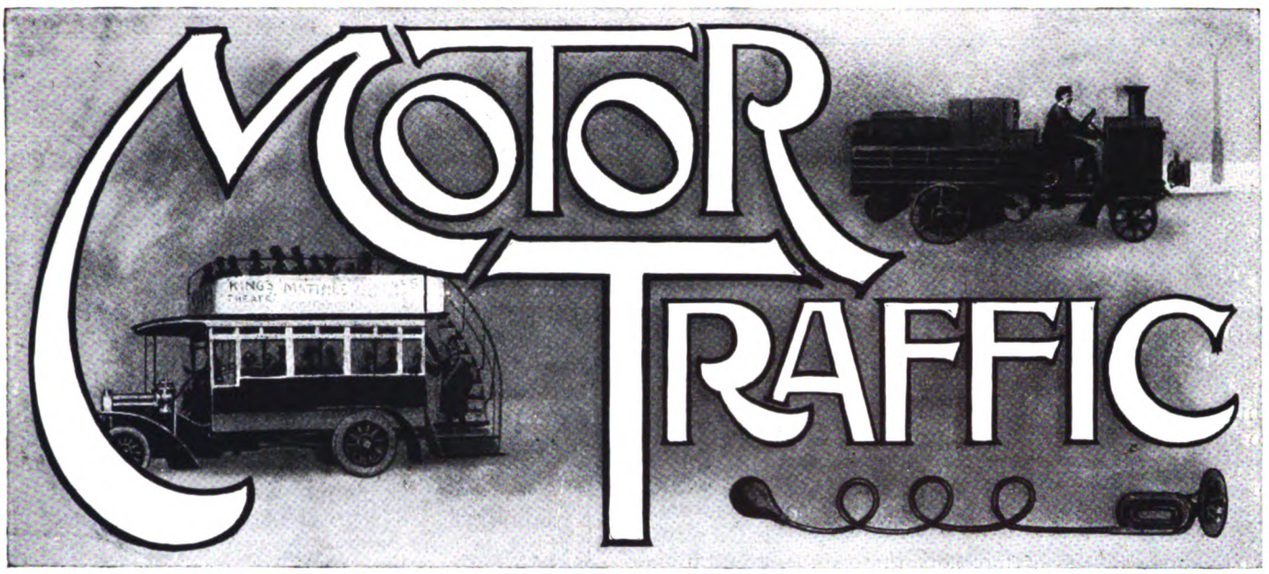

DEVELOPMENTS IN MOTOR FUEL.

Very important developments with regard to motor fuel supplies have occurred during the past few weeks. Elsewhere we refer to the report of the Alcohol Motor Fuel Committee, which we trust will be acted upon by the Government as we are convinced that enormous quantities of power alcohol would be produced within the Empire at a low cost, subject to the necessary removal of restrictions and to preliminary investigations. Meanwhile there has occurred in the Chesterfield district of Derbyshire an event the outcome of which cannot as yet be estimated. Experimental borings conducted at the instigation of Lord Cowdray have rather unexpectedly led to the almost immediate discovery of oil deposits. The quality of this oil appears to be good, the lighter fractions being prominent. As to the quantity, it is too early to speak, but it is decidedly encouraging to know that oil has been struck just where experts expected to find it. It may be found that the deposit tapped is only a small one ; on the other hand it may extend over many square miles. Even in the former case, the discovery is significant, because the existence of small deposits points at least to the possibility of the presence of large ones in the vicinity. It would be impossible to exaggerate the consequences of the discovery of oil in large quantities in this country. Every industry which uses power would be beneficially affected and none more than the motor industry and the carrying trades.

THE POSSIBILITIES OF PARAFFIN.

In considering the fuel situation we must not ignore the possibilities of paraffin, particularly if home supplies of petroleum become available. In the past, paraffin has been more or less neglected, first, because petrol was so cheap, and later because it was generally felt that both paraffin and petrol had to be obtained from the same overseas sources and consequently the price of either could be artificially controlled. Paraffin is of course commonly used on farm tractors after the engines have been warmed up with the help of petrol, but the heavier fuel has not been so successful when used on road vehicles, because the demand for power fluctuates considerably, and it has been difficult to secure perfect combustion under rapidly varying conditions. However, considerable advance has recently been made and there is every reason to hope that, at least so far as commercial vehicles are concerned, we shall presently be able to use paraffin with complete ease and comfort. If this result can be achieved, then the striking of oil in this country, even in moderate quantities, will have a still more marked effect on the economy of motor transport.

THE NEW LONDON OMNIBUS.

The recent experiment of putting lorry omnibuses on the streets of London was not in its early stages particularly successful. Even though weather conditions were favourable the lorries were not well patronised, and the company report a considerable loss on their working. The use of such vehicles is, of course, only acceptable as an emergency proposition. The seating accommodation is not comfortable, there is no good protection against inclement weather and the chassis are by no means ideal for town work of this kind, while the springs are far too hard for the purpose. It cannot be too clearly emphasised that the 3 to 4-ton goods vehicle of military type is of a class totally different from the lighter and, in a sense, more specialised town omnibus chassis. The extensive use of the heavier vehicles would in course of time lead to grave complaints, both as regards deterioration of roads and also as regards vibration of property adjacent to the omnibus routes. We should have a repetition of the old grievance that came into existence when the first heavy types of omnibus were used. Nowadays the limit of weight of the London omnibus unladen is $3\frac{1}{2}$ tons, which is lower than the limits imposed in Paris, New York, and other capitals. Nevertheless, the London General Company will in the near future put into service vehicles of the type illustrated in this issue, which will be capable of carrying no less than 46 passengers (22 inside and 24 outside), or 12 more than the present omnibus. This will, of course, mean an increase in laden weight when the vehicle is fully loaded. It is stated that even with the present 34-seated omnibus, the average patronage is 21 passengers per vehicle. With the new type the average will probably be about 30 passengers, but the great advantage will be felt during the rush hours when full load will be carried. It will certainly be a good thing if we can get a type of vehicle which will render some of our temporary expedients no longer necessary. Strap-hanging in an omnibus is peculiarly uncomfortable, partly on account of the slight vibration of any road vehicle, however well sprung, and partly on account of the flexibility which enables the vehicle to swing and turn rapidly. Moreover, the whole principle of strap-hanging is bad when a vehicle offers two classes of accommodation

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MOTOR TRAFFIC

namely, protected and unprotected. Standing passengers should in such circumstances not be allowed at all so long as there is a seat of any kind available for occupation.

GROWTH OF MOTOR COACH SERVICES.

During recent years the use of motor coaches and chars-a-bancs has necessarily been very much restricted and for a time no fuel at all was available for this purpose. Now we have the beginning of a return to normal conditions, though it has not yet been possible to put upon the road anything approaching the number of vehicles that would correspond with the public demand. The employment of motor coaches is well worthy of encouragement in almost every district and particularly in those that depend to any extent upon the influx of visitors during the season. By the provision of adequate motor services large tracts of country can be brought within easy distance of residents or visitors in an urban centre. Thus, if the country immediately adjacent to the town is not in itself picturesque, there is a new opportunity of strengthening the attractions of the district and so bringing in more visitors to the advantage of the local ratepayer. The development is one that needs a certain amount of watching, because, if allowed to proceed in a haphazard fashion, it is very apt to degenerate. To amount to a real asset, the motor coach must be a reliable and comfortable vehicle, working to time table, so that its patrons may know when it will start and when it will get back. Anything in the nature of touting for custom should be rigorously discouraged. All these provisions can be easily made by the local authority, which has the power of granting or refusing licences. In certain cases it is also possible to arrange that motor coach proprietors shall provide regular services throughout the year in the interests of local residents. Where the business during the season is extremely profitable, it is not unreasonable to attach some such condition to the granting of licences. It is distinctly unwise to license vehicles of inferior quality or when the owners do not possess proper facilities for repair and maintenance.

JUSTIFICATION OF THE LONDON OMNIBUS COMPANY.

The report upon the position of the London General Omnibus Company, prepared by Sir A. Whinney, chartered accountant, at the instance of the Home Secretary, and presented to Parliament on June 20, is a document of great interest not only to those concerned with motor traction but to that vast population which daily travels by omnibus. The object of the investigation was to ascertain whether the increase in fares charged to the public was justified by the additions to working expenses. The report is reproduced in full in this issue, and the case for the company is proved beyond question. Moreover, Sir A. Whinney defends the increase of fares, and it is a tribute to the company that newspapers which with singular freedom from responsibility had fostered the public outcry have been among the first to admit that the management have not passed their burdens on to their customers until necessity compelled them to do so. This surprise investigation, added to facts that are common knowledge to all public passenger undertakings, forbids any allegation that the inquiry was prepared for. In addition, Sir A. Whinney called for further information which was supplied by the company at once. Not until August, 1917, did the first important increase take place in fares, the last addition being in March last, when the inauguration of the eight-hour day followed the considerable additions to the wages of all classes of the company's employees. How heavy has been the increase in the cost of fuel is shown by the rise from 7·8d. per gallon in 1913 to 27·5d. in 1918. More favourable contracts for the supply of tires served to effect a saving in that item as compared with the year 1913. One result of the war conditions was that the company in 1917 and 1918 received an aggregate sum of £400,436 from the common fund of the associated companies, whereas in 1915 and 1916 its trading yielded a total of £570,880 to the fund, after setting aside sums for depreciation and reserve. A heavy item of increased expense is to be found in the cost of maintaining the omnibuses, consequent on higher charges for materials and the keeping of the vehicles longer in service than the five years which is their effective life. This was due to so large a number having been impressed for war service. Sir A. Whinney comes to the conclusion that up to the end of 1918, which is as far as his investigation goes, the increases in fares were fully justified, even in view of the accumulation of a reserve fund of £1,904,868, built up by annual sums of between £265,000 and £285,000. This reserve, the investigator shows, is not excessive when it is remembered that 2,500 new vehicles will be required to bring the numbers up to those existing in 1914, replacing the whole fleet with the exception of 250. The most serious portion of the report, from the point of view of all transport undertakings, is the statement that the quarter ended March 31 last shows an actual loss of £9,590. Since the close of the quarter the eight-hour working day has involved an addition of £600,000 to the wages bill, while it is estimated that the raising of the fares in March last will not completely cover the working costs. These costs advanced from 7·10d. per mile in 1913 to 14·05d. in 1918. How small is the margin of profit upon which a company works is shown by the takings per mile, which in 1913 were 8·57d., and in 1918 15·32d. The increase was owing to the great decrease in mileage run by the smaller number of omnibuses. For the second year the increase was roughly only a penny, for the third and fourth years another penny, followed by an additional twopence and an extra threepence for the last two years, when fares were revised.

RUBBER FOR ROAD PAVING.—In continuation of the experiment with rubber as a road surface at the corner of Old and New Kent Roads, London, the Southwark Borough Council and the Rubber Growers' Association propose by September next to pave 400 square yards with rubber on the west side of the tramway track between Borough High Road and Marshalsea Road In the last experiment the rubber was dovetailed on to wood blocks, and though it has worn remarkably well, the wood blocks show some shrinkage. In the new trial the rubber is to be vulcanised on to steel plates fastened into concrete in order to avert shrinkage.

U.S.A. HIGHWAY CONSTRUCTION.—Twenty-six States had up to the end of May approved bond issues to a total of over 823,300,000 dollars for the improvement of highways and the construction of new roads. Of this amount 177,800,000 dollars has been authorised in seven States, 411,500,000 is being referred to the vote of the people; 135,000,000 dollars is being considered in four States, and three States have voted against measures totalling 85,000,000 dollars. The Secretary of Agriculture has approved 1,057 project statements for Federal Aid roads, involving the improvement of 10,580 miles, at an estimated cost of 92,933,000 dollars.

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MOTOR TRAFFIC

ALCOHOL AS A MOTOR FUEL.

POSSIBILITY OF AN IMPERIAL INDUSTRY.

The report of the Inter-Departmental Committee on Alcohol Motor Fuel is an interesting document, particularly, perhaps, in view of the fact that the Committee is mainly constituted of official representatives of Government departments interested in particular questions of national policy rather than in the more scientific aspects of the case. Thus, the majority of the Committee have come fresh to the subject with the object of forming an opinion as to whether it is a matter of first-rate importance, and if so, what ought to be done about it. The conclusions reached are, on the whole, entirely favourable to immediate action. It is considered that the Government ought to take the matter up and form a permanent organisation, well staffed and well supplied with funds, to conduct experimental and practical development work and to educate public opinion so as to ensure support of the legislation that will presently be necessary in order to get our alcohol distilled and denatured as cheaply as possible.

The one point with regard to which the Committee is rightly pessimistic is the possibility of producing alcohol in large quantities from vegetable sources grown in the British Isles. Probably the best home source would be the potato, but only about 20 gallons of alcohol can be obtained from a ton of potatoes, so that, even at the low cost of about £2 a ton, the raw material would work out at 2s. a gallon, to which we should afterwards have to add the cost of distillation, of denaturing, and of distributing the spirit. The one chance of producing power alcohol in this country appears to lie in its synthetic conversion from ethylene extracted from coal and coke oven gases. This source of supply, however, lacks the great advantage which alcohol otherwise possesses. So long as we obtain our fuel from coal, we are helping to exhaust a supply which is not inexhaustible, and can only be renewed by a very gradual process that is beyond our control. The great argument in favour of alcohol is that we can get it from crops which we can grow at will over almost any acreage we please, so as to meet the increase of demand year by year.

It is clearly our duty to see that the British Empire shall be the main seat of this great new industry, which we can create whenever we please, and the products of which will fill a certain and ever increasing demand. We can get alcohol from any vegetable matter that contains a good percentage of sugar, starch, or cellulose. Among the most promising sources are molasses, maize, and other grains, sugar beet, and various trees or flowers. Thus, for instance, the report gives as an example the mahua tree, the flowers of which are very rich in sugar. The tree grows in Hyderabad and other parts of India. From one ton of the flowers some 90 gallons of alcohol can be obtained, the raw material costing locally only about 4d. a gallon. No doubt the cultivation of the tree could be easily extended. It seems fairly certain that the raw material cost would be no higher if we were to depend on molasses, maize, or millet, provided that cultivation were intelligently organised in suitable regions and on a large scale.

Turning to the use of the fuel, there is plenty of evidence that it is suitable, more particularly when employed as a part of a mixture, as in the latter case no change in engine design is necessary. Among the mixtures that have already proved themselves good are alcohol-benzol, alcohol-benzol-petrol and alcohol-ether. The last-named should facilitate starting from the cold in all climates, but might introduce storage difficulties in hot weather. The Inter-Departmental Committee has arranged for a series of experiments on the combustion of alcohol mixtures, which should help engineers to secure higher efficiency with these fuels. It has also arranged a big experiment or demonstration, now in progress, the results of which will be available in due course. At its request the London General Omnibus Company is running a fleet of omnibuses regularly on alcohol mixtures, and the fact that this is going on without Londoners having noticed it is in itself fairly good proof that these fuels are comparable with those with which we are more familiar.

The general conclusion is that further development should be undertaken by the State, working in close touch with the Overseas Governments of the Empire, and should not be dependent solely upon private enterprise. This is undoubtedly correct, seeing that a preliminary to the successful use of alcohol fuel on a large scale must be the removal of various regulations imposed by the State and not likely to be withdrawn except as a result of pressure from official quarters. We hope that this report will be acted upon promptly by the Government. The fuel situation grows more and more difficult, and there can be no excuse for neglecting an evident opportunity of making the Empire as a whole independent of imported supplies by giving encouragement to a new branch of agriculture, and providing means of increasing the economy of transport.

CAR AND OMNIBUS.

BY A USER OF BOTH.

The practical mind is stirred to other reflections than those that delighted Sir W. Bull and Sir W. Davison when the tramways manager of the County Council was giving evidence before the London Members' Committee. In view of the Council having sought powers to use omnibuses for linking and extension purposes, the two members sought enlightenment as to whether the omnibus is likely to "run the tramway car off the road." Mr. Fell's reply was that the London streets would be "rendered impossible" if cars were replaced by omnibuses. Probably the word used by Mr. Fell was impassable and not impossible, for in answering a variation of the question later on, he gave the answer, well-known to managers, that in wet weather five omnibuses would be required to move the load of one car, and that if the change was effected the streets would become greatly congested. Granting that the car propelled from a central station is the most effective and the cheapest instrument for heavy haulage, and that a road impost may before long be placed upon the vehicle that is ideal for pick-up traffic, it only needs an impartial survey of the busiest London streets to come to the conclusion not altogether in accord with Mr. Fell. Rightly it is held that the rapid progress of a trmaway car is preventive of congestion. This is still more the case with the omnibus; moreover, it gives a free passage when a car cannot because of its inability to go round an obstacle. Then as to the congestion which it is alleged will result from augmentation of omnibuses. The best refutation is for the disbeliever to stand a hundred yards away from the junction of streets at Parliament Square, and witness the working of vehicular traffic after it has been held up to enable a cross flow to pass. Emerging from Parliament Street there will be two lines of omnibuses, 12 deep, which on liberation dash off and become well spaced out. There would be nothing like so much room between two lines of cars, despite the unenforced Board of Trade regulation as to the distance to be maintained between cars. From the pedestrian's point of view a disadvantage of the omnibus is that its speed renders somewhat perilous the crossing of a street. This is despite the fact that the omnibus limit is four miles per hour less than the maximum permitted to the car on its widest route. Sufficient work is available for both cars and omnibuses, and it is futile for partisans to speculate upon the disappearance of one or the other. At this juncture it is easier to obtain omnibuses than to construct tramways, as numerous tramway authorities have shown by placing of orders for the self-propelled vehicle. At this reconstruction period there are matters of car and omnibus design that loudly call for prompt action. No new car ought to be ordered unless it is built for front end exit. This expeditious method of handling is already practicable with single-deck cars, and examples of double-deck cars with front exits are to be seen in more than one town. Reform in this direction is still more urgent in the case of double-deck omnibuses. It is remarkable that the public have not discovered that the present design offers no means of going to the help of the driver if he is taken ill. Then, in the London County Council's area, omnibuses would not be less popular if the lower saloon of the cars were provided with cushions or spring seats. Both of these are in use on the company-owned lines of the metropolis, greatly to the comfort of the passengers and to the preservation of their clothing.

ELECTRIC WAGONS FOR SANITATION.

Mr. J. A. Priestley, cleansing superintendent of Sheffield, has recommended that the horses now engaged in the collection of house refuse should be replaced by 51 additional battery vehicles, the purchase to be spread over a period of six years. The estimated cost of the equipment is about £100,000, and Mr. Priestley advises that six battery vehicles, one generator, and ten charging panels be obtained at once. The need for these has been increased by the reduction of working hours and the renewal of privy conversion, and the cost would be £12,000. The Finance Committee have approved of the expenditure of £14,200 during the current year out of revenue, on the understanding that before the contracts are definitely placed the Health Committee will consider further whether electrical vehicles are preferable to petrol or steam vehicles.

Blaenavon Urban Council's surveyor has received a report from the engineer to Pontypridd Urban Council, to the effect that the four Edison battery wagons engaged in scavenging and other work in the latter hilly district have given every satisfaction. Three of them in 12 months' working had realised a saving of £1,650 compared with previous horse haulage. A deputation was recently sent to Pontypridd to inspect the lorries and report to Blaenavon Council, whose surveyor advocates the purchase of one lorry.

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LONDON GENERAL OMNIBUS COMPANY.

A REPORT BY SIR ARTHUR F. WHINNEY AFTER INVESTIGATION OF THE COMPANY'S ACCOUNTS.

INCREASED FARES JUSTIFIED BY OFFICIAL INVESTIGATION.

Sir Arthur F. Whinney, who was appointed by the Home Office to investigate the accounts of the London General Omnibus Company, for the purpose of ascertaining whether the recent increases in fares were justifiable, has presented the following report. Mr. Whinney's conclusion is that the increase in working expenses fully justified the action of the company :—

1. In compliance with instructions with which you have favoured me I have the houour to report that I have investigated the accounts and records of the London General Omnibus Company, Limited, for the purpose of ascertaining whether the increase in fares charged to the public is justified by the increase in the Company's working expenses.

2. I have had before me the statements submitted to you by the Company and have had due regard to the contentions set forth therein so far as the same are material to the main object of the inquiry. I have also called for further information which has been supplied by the Company.

3. *Arrangements with Associated Companies.*—In order to enable the subject to be understood it is necessary to refer to the arrangements which exist between the London General Omnibus Company and its Associated Companies, namely, the South Metropolitan Electric Tramways and Lighting Company, Limited, the Tramways (M.E.T.) Omnibus Company, Limited, and the Gearless Motor Omnibus Company, Limited. Up to December 31, 1918, the Associated Omnibus Company was also a party to this arrangement, but this company has since been absorbed by the London General Omnibus Company, hereinafter referred to as the "General" Company, who have purchased its entire fleet of motor omnibuses.

The working arrangements vary in each case, but, broadly speaking, the "General" Company run the motor omnibuses of the Associated Companies as though they were its own. It arranges the routes, provides the drivers and conductors and all working expenses. The "General" Company takes all receipts and pays to the Associated Companies an agreed proportion thereof. The "General" Company also charges each Associated Company with a proportion of the working expenses based upon the agreed average cost of running and it pays over to the Associated Companies the difference between the proportion of receipts and expenses so arrived at.

This arrangement was in existence in July, 1914, when the "commandeering" of motor omnibuses came about and the position became somewhat changed, for the War Office did not select a proportionate part of each company's fleet, but took the motor omnibuses at will. In the case of the Gearless Company the whole fleet was "commandeered." It was, therefore, mutually agreed that each of the Associated Companies should remain relatively in the same position as they were before "commandeering" took place, and in order to carry this arrangement into effect a table was drawn up showing the number of motor omnibuses owned by each company in July, 1914, and the takings were divided in the following proportions :—

	Motor Omnibuses.	Percentage to Total.
London General Omnibus Company	2,636	85·83 per cent.
South Metropolitan	10	·33 ,,
Tramways (M.E.T.) Omnibus Company	350	11·40 ,,
Gearless Company	20	·65 ,,
Associated Company	55	1·79 ,,
	3,071	100·00 ,,

These percentages were slightly modified at a later date when the "General" Company acquired some additional motor omnibuses, but not sufficiently to cause more than a fractional difference.

As regards expenses these were also apportioned on the basis of the estimated cost of running, and although other factors arise which slightly vary the proportions, broadly speaking, they are apportioned on the above basis. Other arrangements with five other companies are also in existence, but they do not materially affect the above-mentioned division.

4. *The Common Fund.*—There is also another important agreement in operation under which there has been established a common fund. This agreement was entered into by virtue of the provisions of the London Electric Railways Facilities Act, 1915, passed on July 29, 1915, under which the City and South London Railway Company, Central London Railway Company, the London Electric Railway Company, the Metropolitan District Railway Company, and the London General Omnibus Company, retain all monies received for traffic including through fares, rates, &c., without apportionment, except as regards apportionments due to other companies not parties to the agreement. The amount of through fares is, however, insignificant so far as the "General" Company is concerned.

Under this agreement each company pays its own working expenses, fixed charges and interest on debentures, dividends on preference stocks and shares (except the Second Preference Stock in the Metropolitan District Railway Company) and retains such sums as it thinks reasonably necessary for depreciation and reserve. The balance of income remaining is paid over to the common fund which is then distributed as follows :—

	In respect of each half-year down to and including that ending December 31, 1915.	In respect of the half-year ending June 30, 1916, and each succeeding half-year.
City and South London Railway	2 per cent.	6 per cent.
Central London Railway	20 ,,	20 ,,
London Electric Railway	26 ,,	30 ,,
Metropolitan District Railway	12 ,,	12 ,,
London General Omnibus	40 ,,	32 ,,
	100 per cent.	100 per cent.

The amounts paid into and received out of the common fund by the "General" Company are as follows :—

Year.	Amounts paid in. £	Amounts received out. £
1915	311,803	180,546
1916	259,077	162,230
1917	Nil	190,396
1918	Nil	210,043
	£570,880	£743,215

It will be seen that whilst in 1915 and 1916 the contributions of the "General" Company to the common fund were considerably in excess of the share which it received out of the fund, in 1917 and 1918 the position was reversed, for whilst the "General" Company contributed nothing to the Railway Companies, the latter contributed large sums to the revenue of the "General" Company

It should be pointed out, however, that the figures of "Takings" and "Working Costs" hereinafter set out are exclusive of the amounts received out of or paid into the common fund.

5. *Increase in Fares.*—Apart from some minor and unimportant increases which took place during the earlier part of 1917, the increase in fares commenced in August, 1917, and has since continued at intervals.

The last important rise took place at the end of March last, when the company found itself faced with an increase in working expenses consequent upon the inauguration of an eight-hour day

6. *The Method of Raising the Fares.*—The principle upon which the company has acted in raising fares is to reduce the distance carried for a penny.

The company, however, does not adopt a uniform fare over the whole of London and surrounding districts served by its motor omnibuses, but it divides its operating zone into sections in order to meet competition arising from the London County Council and other tramways and the railways owned or run over by the Metropolitan Railway Company. The undernoted statement submitted by the company shows the distances a passenger is or was carried for a penny :—

	Previous to 1917 Revision.	From August, September, 1917.	From June, July, 1918.	From March, April, 1919.	From May, June, 1919.
Central area (including City), west and north-west area	1·60	1·53	1·38	1·25	1·25
Rest of London and suburbs	1·52	1·52	1·46	1·46	1·31 (Estimated, revision not completed)

It is to be understood that the above-mentioned distances are approximate, the nearest traffic point being made use of in determining the actual stages, but in the main the principle of length of distance run has been generally adopted.

7. *The Effect on the Takings of Raising the Fares.*—In order to appreciate the effect on the takings by the "General" Company and its Associated Companies of the increase in fares, it is necessary

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to take into account the number of motor omnibuses in service and the mileage run, and so that a comparison may be made with the pre-war period, the figures are supplied as from and including the year 1913 :—

Year.	Average No. of Motor Omnibuses in Service.	Miles run.	Gross Takings.	Takings per Mile Run.
			£	d.
1913	2,448	103,951,252	3,713,688	8·57
1914	2,295	99,365,363	3,785,581	9·14
1915	1,767	75,451,236	3,388,230	10·78
1916	1,822	77,070,147	3,528,602	10·99
1917	1,654	67,963,537	3,601,258	12·72
1918	1,660	67,197,422	4,289,114	15·32

The result is to show a gradual increase in the takings per mile run from 1913 to 1916, and a marked increase in 1917 and 1918, when the revised fares came into operation.

It may therefore broadly be stated that the raising of the fares brought the company and its associates in 1918 (when the full effect of the increased fares began to be felt), an increased revenue from traffic over that of 1917 of £687,856, even though the miles run were upwards of 760,000 less.

8. *Working Expenses.*—It is now necessary to give consideration to the other side of the revenue account, viz., the working expenses. These the company divides under the main headings of Traffic Expenses; Maintenance, Repairs, and Renewals; Petrol; Tires; Other Expenses including Administration; Compensation; Depreciation of Leases, Plant, and Machinery, and Insurance Fund Contribution. The details of these expenses are voluminous, but they may be briefly explained thus :—

As regards maintenance (*b*), attention is drawn to the figures, which show a gradual increase, the cost per mile run for 1917 and 1918 being more than double the cost per mile run for 1913 and 1914.

The company state that maintenance charges have increased by reason of the necessity of spending more upon the upkeep of the motor omnibuses owing to the age of the vehicles. They state that the "effective life" of a motor omnibus is five years, after which time it becomes unprofitable by reason of wear and tear, that the average life of the motor omnibuses now running in service is seven years and that, therefore, they have been running two years more than their "effective life."

It is difficult to resist the accuracy of these contentions in face of the figures, which prove that maintenance has cost the company considerably more per vehicle as each year passes.

For instance, in 1913 the maintenance charge debited to working expenses was £659, 740, or £222 per vehicle, in 1917 it amounted to £898,636, or £416 per vehicle, and in 1918 it rose to £955,344, or £451 per vehicle.

The comparison is somewhat affected by the rise in wages which took place in 1917 and 1918, but even allowing for this the Company's contention seems amply borne out by the figures.

With regard to petrol (*c*), the progressively increased costs are shown in the statement above referred to. Whilst in 1913 the cost of petrol required to move a motor omnibus a mile was 1d., in 1918 it cost 3¾d. In 1913 petrol cost on an average 7·8d. per gallon

In 1914	,,	,,	8·3	,,
In 1915	,,	,,	9·6	,,
In 1916	,,	,,	10·8	,, (the tax was doubled)
In 1917	,,	,,	18·7	,, (increase in the price)
In 1918	,,	,,	27·5	,, (increase in the price)

As regards tires (*d*), it will be observed that there is a substantial saving in the cost of tires during the latter years of the company's existence compared with 1913 and 1914. The company explain that in 1915 they effected new contracts of a more favourable character, the beneficial nature of which is reflected in the statement.

	1913.	1914.	1915.	1916.	1917.	1918.
	£	£	£	£	£	£
(*a*) Traffic expenses, including wages	1,266,690	1,339,198	1,164,595	1,238,184	1,200,509	1,475,923
(*b*) Maintenance, repairs, and renewals	659,740	645,259	670,698	793,610	898,636	955,344
(*c*) Petrol	431,206	482,466	411,241	469,441	735,717	1,061,640
(*d*) Tires	440,202	331,642	184,811	166,885	144,843	135,825
(*e*) Other expenses, including administration, depreciation, &c.	276,260	280,907	266,358	305,509	300,081	302,297
Total	3,074,098	3,079,472	2,697,703	2,973,629	3,279,786	3,934,029

In order to appreciate the full meaning of the figures it is necessary, as in the case of the traffic receipts, to regard them in relation to the miles run. The subjoined table supplies the information :—

	1913.	1914.	1915.	1916.	1917.	1918.
	d.	d.	d.	d.	d.	d.
(*a*) Traffic expenses, including wages	2·92	3·24	3·70	3·86	4·24	5·26
(*b*) Maintenance, repairs, and renewals	1·52	1·56	2·13	2·47	3·17	3·41
(*c*) Petrol	1·00	1·16	1·31	1·46	2·60	3·80
(*d*) Tires	1·02	·80	·59	·52	·51	·50
(*e*) Other expenses, including administration and depreciation	·64	·68	·85	·95	1·06	1·08
Total	7·10	7·44	8·58	9·26	11·58	14·05

With regard to traffic expenses (*a*), it will be seen that there is a very substantial increase in traffic expenses per mile run in 1917 and 1918, compared with that of the previous year. This is mainly caused by the increased pay given to drivers and conductors as compared with the mileage run. The figures of wages paid to this class of employees were as follows :—

	£
1916	838,799
1917	810,423
1918	1,028,389

The decrease in 1917 is partly caused by the fact that the mileage run was about 9,000,000 miles less than in 1916. If the figures are adjusted on a mileage basis they will work out thus :—

1916—2·6d. per mile run; 1917—2·8d; 1918—3·7d.

The remaining wages also show a considerable increase.

As regards other expenses (*e*), it is not necessary to say more than that they include administration expenses, compensation, insurance, &c. Depreciation is charged in respect of leases, plant, and spares at rates which are fair and reasonable; nothing is included in this item for reserves, which are dealt with in paragraph II.

9. *Revenue from Takings and Working Expenses Compared.*—The subjoined statement presents in summarised form the revenue from traffic and expenses of working.

This table bears out the statement that although the raising of the fares in 1917–18 brought the Associated Companies a substantially increased revenue, the advantage has been more than overborne by the increased working expenses. If comparison of the result of working is made between the average of the years 1913–16 with those of 1917–18 (when the rise in fares and expenses took place), it will be seen that in the latter years the Company was worse off on revenue account by 43·46 per cent.

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MOTOR TRAFFIC

	1913.	1914.	1915.
	£	£	£
Takings	3,713,688	3,785,581	3,388,230
Advertisements	61,150	57,353	52,350
	3,774,838	3,842,934	3,440,580
Less expenses ...	3,074,098	3,079,472	2,697,703
Net balance arising on working account	700,740	763,462	742,877

	1916.	1917.	1918
	£	£	£
Takings	3,528,602	3,601,258	4,289,114
Advertisements	60,224	58,011	63,292
	3,588,826	3,659,269	4,352,406
Less expenses ...	2,973,629	3,279,786	3,934,029
Net balance arising on working account	615,197	379,483	418,377

10. *The conclusion* is therefore arrived at that up to the end of the year 1918 the increase in fares charged to the travelling public by the Company is fully justified by the increased working costs.

11. *Reserves.*—Before passing away from this conclusion it is, however, necessary to give due consideration to the reserve fund which has been built up by appropriations from revenue extending over the whole period of the company's existence. It is to be understood, however, that these appropriations do not affect the figures of the working results referred to in this report, as the allocations are made after—not before—the figure of revenue on working account is arrived at. The sums thus set aside annually have varied between £265,000 and £285,000. In 1918 they appeared in their entirety on the face of the revenue account, but in the other years they have been partly hidden. In December, 1918, the whole amount was disclosed and it stands in the balance sheet of that date at £1,904,868. The question is, is this amount excessive, for if it is, it may reasonably be argued that the company should have reduced its fares by such excess. The answer turns upon the necessity for the replacement of the fleet and the cost of doing so.

According to the information supplied by the company it will be necessary to replace the whole fleet with the exception of 250 vehicles, and to bring its numbers up to those at the outbreak of war. This means 2,500 new vehicles, the cost of which the company estimate at £1,200 each at least. If these figures are correct (and there appears no reason to doubt them) the sum required is £3,000,000. Towards this sum there is in hand £511,153 arising from the sale of motor omnibuses to the Government in addition to the reserve above referred to. It is estimated that the replacement will take at least two years, so that contributions from revenue of at least £250,000 per annum will be required to meet the entire expenditure, whilst more will be necessary if the fund is to be placed on a sound footing to meet wear and tear during that period.

Although these conclusions seem irresistible, it should be pointed out that in all probability the company will in future experience a considerable fall in the price of petrol and in maintenance charges and should obtain a greater volume of traffic from the fact that the new omnibuses are to be constructed with a greater passenger carrying capacity. The conclusion, however, remains that the reserves made in the past are not more than what is necessary to meet the company's present requirements.

12. Before closing this report it is desirable that some reference should be made to existing conditions, as since the accounts were closed in 1918 a further large addition has been made to the operating costs.

The company's working statement for the quarter ending March 31, 1919, shows that after taking into account the increase in wages granted during 1918 (the full effect of which is reflected in this quarter's accounts) working has resulted in an actual loss of £9,590 for the quarter.

Since the close of the quarter, however, an eight-hour working day has been established for all classes of the company's employees, and the basis of payment to drivers and conductors has been changed. Previously they had been paid upon a mileage basis—that is to say, at so much per mile run, now they receive pay on the basis of hours worked.

The company have submitted an estimate which shows that the addition to their wages bill caused by the introduction of the eight-hour working day will amount to £600,000 per annum, which will increase as a larger number of vehicles comes into operation. On the other hand, some overtime may be saved when additional drivers and conductors are trained. So far as has been possible this estimate has been verified to be correct.

Against this increased cost additional revenue will be derived from the raising of the fares since March, 1919, but it is estimated that such additional revenue will not completely cover the additional working costs.

ILFORD MOTOR OMNIBUS SCHEME.

Ilford Urban District Council have decided to seek powers to run motor omnibuses.

In this connection the tramways manager (Mr. L. E. Harvey) reported:—According to instructions, I have to report upon the advisability or otherwise of a system of motor omnibuses as an adjunct to the tramways in Ilford.

As long ago as January 30, 1913, I made an exhaustive report upon the use of omnibuses to serve the Cranbrook Estate, and that since the London General Omnibus Company touched the estate a very large number of people were patronising the omnibuses, and this, of course, still holds good, although the service from the Beehive Lane to Ilford is far from a good one.

In the middle of the day there is also a fair traffic from ladies who wish to get into the town to do shopping, etc.

I suggested from my observations that a very favourable route would be a circular one from Ilford Station down York Road right up to the top of Belgrave Road as far as Stanhope Gardens, along that road across the top of the Drive, down Clarendon Gardens or Cowley Road into Cranbrook Road, and thence straight back to the station.

This route is fairly central for all side streets in the district, and I suggest that we might run two omnibuses round the circle in each direction, the whole circle taking about 20 minutes, but in the middle of the day it may be possible to run a reduced service.

There is another district in Ilford that appears to me to warrant some attention in the way of traffic facility, and that is what is commonly called the South African Estate, and Green Lanes district, and I would suggest that here again there is a circular route taking in Seven Kings Station and Goodmayes Station. It would be down Goodmayes Road, along Green Lane and Seven Kings Road, crossing the High Road at Seven Kings Station, then along Cameron Road and Aldborough Road up to the Downshall School, and then along Meads Lane to Westwood Road, down Westwood Road as far as Athol Road, and thence into Barley Lane, crossing the High Road again at Goodmayes Station. This would give a circular route of about the same length as the Cranbrook circle, and I think four omnibuses (two each way) would serve it.

It occurs to me that these omnibuses would not be required on the routes mentioned on Sundays, and, in fact, perhaps the residents would prefer not to have omnibuses on these routes on that day, and it would be possible to utilise them for running outside our district to places of interest in the neighbourhood, provided we have the powers so to run.

I do not propose at this stage to go fully into the question of cost, but roughly speaking we should want ten omnibuses for the two schemes, and if these were petrol omnibuses they would cost from £1,000 to £1,200 each. A garage would have to be provided alongside our tram shed and certain machinery provided, and I do not think the whole scheme would cost less than £20,000 to £25,000 actual expenditure.

At the time I originally reported upon this Cranbrook scheme I advocated electric omnibuses but the cost is now so prohibitive and the delivery so uncertain that I no longer think this is a practicable proposal, and I therefore suggest, as above, the use of petrol vehicles.

PNEUMATICS FOR OMNIBUSES.—The Fifth Avenue Coach Company New York, has been experimenting with pneumatic tires on its motor omnibuses, and the results have shown remarkable decreases in the consumption of gasoline. Tests for three months with both pneumatic and solid tires give increases in miles per gallon with the use of pneumatics. The company has figured that a reduction of only 1 per cent. in gasoline consumption for one year means a saving of 3,700 dollars. Trials are also in progress with a 50-50 mixture of benzol and kerosene, and if it is a success it will mean a fuel cost of 16½ cents per gallon, as against gasoline, which costs from 22 to 26 cents per gallon. A special carburetter for using kerosene only is being tried.

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MOTOR TRAFFIC

The Popular Light Chars-a-Banc Made by Messrs. D. Napier and Son.

CHAMPION MOTOR DRIVERS.

The results of the annual written and practical examinations of commercial motor drivers, held by the Commercial Motor Users' Association, have been announced. The examiner in his report to the association states :—

"Only a few new men attended for the examination, but the old candidates showed greater determination than ever to win the highest prizes. I was also pleased to see that interest in the examinations does not cease when a man wins a top prize, and we had visits during the afternoon from two previous championship winners. The work of judging has been more difficult than ever, both in the written and practical portions of the examination, and I had to call in the assistance of two engineer friends to determine the final placing of the order of merit of the practical samples of work."

The following are the chief prize winners :—

CHAMPIONSHIP PETROL EXAMINATION.

Champion Petrol Driver—£10, diploma, and medal :—W. G. Hayter (employer, H. G. Burford and Company, Limited).

£5, diploma, and medal .—A. J. Woodcock (employer, E. Nelson and Company, Limited).

CHAMPIONSHIP STEAM EXAMINATION.

Champion Steam Driver—£10, diploma, and medal :—H. Button (employer, Higgs and Hill, Limited).

£5, diploma, and medal :—W. Stevens (employer, Sun Flour Mills Company, Limited).

CLASS II. PETROL WRITTEN AND PRACTICAL EXAMINATIONS.

£5, certificate, and badge :—R. Messer (employer, E. Nelson and Company, Limited).

£3, certificate, and badge :—C. R. Dale (employer, J. Travers and Sons, Limited).

£2, certificate, and badge :—C. H. Dench (employer, Bryant and May, Limited).

CLASS II. STEAM WRITTEN AND PRACTICAL EXAMINATIONS.

£5, certificate, and badge :—W. Polley (employer, Bryant and May, Limited).

£3, certificate, and badge :—R. H. Wallis (employer, General Post Office, Stores Department).

£2, certificate, and badge :—F. G. Mobbs (employer, Sun Flour Mills, Limited).

CLASS II. ORAL EXAMINATIONS.

Prize (petrol) of £2, certificate, and badge :—G. H. Warren (employer, Bluthner and Company, Limited).

Prize (steam) of £2, certificate, and badge :—Equal firsts, J. Anderson (employer, Westminster City Council); R. Slater (employer, Westminster City Council).

ELECTRIC VEHICLE PROGRESS.

Birmingham Corporation are advised by the Salvage, Stables, and Lighting Committee to sanction a contract with Edison Accumulators, Limited, for the purchase of 25 electric lorries at a cost of £32,000. The vehicles are to be used for the collection of house refuse, and will supplant horses. The company gave a guarantee that the machines should be built in this country at the works they are about to establish at Birmingham. The company guarantee the batteries for ten years.

In April last Hampstead Council obtained delivery of a 3½-ton Orwell electric tipping wagon from Messrs. Ransomes, Sims, and Jefferies. The cost of the vehicle was £1,077, and it had been ordered as long ago as 1917, war conditions preventing earlier delivery. It is engaged in delivering house refuse to the barges on the Paddington Canal, bringing back road material. During May the work of the machine was equal to that of three horses and vans, and Mr. Winter, the borough surveyor, estimates that it will effect an annual saving of £400. An order is being placed for a 2-ton Orwell tipping wagon.

As horse hire is now so costly, the London County Council propose to do away with the horse-drawn tower wagons and to purchase four electric tower wagons at a total cost of £7,000.

Having considered the merits of steam, petrol, and electric vehicles for street scavenging, Newport Corporation have decided upon electric vehicles.

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MOTOR TRAFFIC

NEW OMNIBUS FOR LONDON.

A great improvement in every way will be the new type of omnibus which the London General Omnibus Company are providing for use in the Metropolis and in those of the surrounding districts in which the traffic is heavy enough to warrant its introduction.

Three drawings of the new vehicle are given on the following page. As soon as the approval of the Public Vehicle Department of the Metropolitan Police has been obtained, the company will proceed to have 500 of the omnibuses constructed at the works of the Associated Equipment Company at Walthamstow, and, according to the evidence given before the Select Committee on London Traffic, these conveyances should be ready by the end of next October. The most notable features are (1) that the floor is lower and therefore more convenient for entering and alighting than in the present type, and (2) that the seating accommodation is twelve in excess of the existing omnibus. The latter has seating accommodation for 34; the new vehicle will provide seats for 46, of whom 22 will be carried inside and 24 outside. In New York there are omnibuses carrying 52 persons, but their weight is very great.

Decided improvements are that the majority of the passengers on the new machine's lower deck will be seated facing the direction of the omnibus, and that there is spacious standing room under cover for passengers entering and leaving, both inside and outside the saloon. To achieve this result the length of the chassis and of the body has been slightly extended. By increasing the platform length from 3 ft. to 3 ft. 10 in., facility is given to passengers to get on and off simultaneously, whereas at present persons wishing to ride must wait until the others have descended. Under the latter conditions the result is that people competing for seats mount the platform, leaving only a slight space for top and lower deck passengers to leave by. The unladen weight is 3 tons 10 cwt., which is no heavier than the existing omnibus.

As to the cost, Mr. Frank Pick, the commercial manager of the Associated Companies, informed the Select Committee that before the war the charge for a chassis was £535, to which had to be added £15 for electric lighting installation. At the present time it is estimated that the chassis will cost £825, and in addition there is £45 for lighting. The charge for a body in 1914 was £132, as against £309 now, so that the total expenditure on a complete vehicle has risen from £691 to £1,179. The life of an omnibus is considered to be five years, but owing to the war the majority have been in use for seven years and over. This prolonged service adds so greatly to the cost of maintenance that the company desire to have the new vehicles constructed as soon as possible.

THE ROAD CONGRESS.

At the Executive of the County Councils' Association the secretary made the following report with regard to the forthcoming road congress and exhibition at the Royal Agricultural Hall, London. The exhibition will be opened on Thursday, November 20, and will close on November 27.

The following bodies have appointed representatives on the Congress Committee:—The Association of Municipal Corporations, the Urban District Councils Association, the Rural District Councils Association, the Institution of Municipal and County Engineers, and the County Surveyors' Society.

Invitations to take part in the congress and visit the exhibition have been addressed to the 34 representative bodies selected by the Executive Council of the County Councils Association, and a very satisfactory number of acceptances has been received.

Similar invitations have been sent to the representatives of the Dominion Governments, and the Association have been informed that there appears to be no objection to invitations being sent to the principal foreign governments.

The President of the Local Government Board has informed the Association that he will be happy to give favourable consideration to any application which may be made by local authorities, whose accounts are subject to Government audit, for the payment of the reasonable expenses of two delegates in attending the congress. The Board express the view that one delegate should be the surveyor or other officer of the local authority.

The Executive instructed the secretary to communicate with the Permanent International Association of Road Congresses as to the attendance of representatives of foreign governments.

It was arranged that the congress should deal with the following main subjects:—(*a*) the reconstruction and maintainance of roads; (*b*) the question of heavy traffic, both as to the regulation of the user of roads by particular types of vehicles and as to the weight, construction, and speed of vehicles; and (*c*) the future development of traffic facilities in rural districts.

A sub-committee was appointed to decide upon the details of the papers to be read, the persons to be invited to contribute them, and the number and times of the congress sessions, and the committee was appointed as under:—Mr. Rees Jeffreys, Mr. F. H. Berryman, Mr. H. T. Wakelam, and the secretary.

FARNBOROUGH FARES DISPUTE.

On June 6, Sir A. Bodkin applied to the Lord Chief Justice and Mr. Justice Salter for an order nisi for a mandamus directed to Farnborough Urban Council, to show cause why they should not hold a further meeting and consider the granting of licences to omnibuses plying in their district.

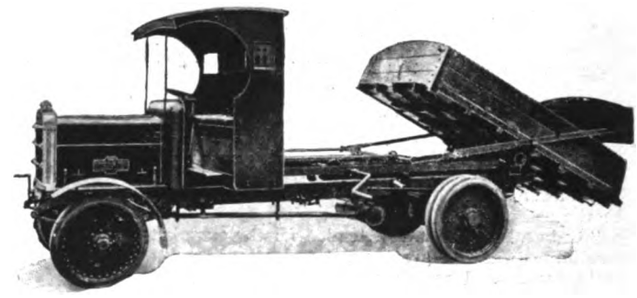
Counsel explained that the Aldershot Traction Company had run their omnibuses in the area of the Farnborough Council for ten years, but this year the Council refused to license them to run in their area owing to the company's action in raising a fare from 2d. to 3d. The Council said this fare was excessive, and that there should be penny stages.

Sir A. Bodkin contended that the Council had no power in law to take any regard to the fares charged in considering the grant of licences so long as the fares were properly published in the omnibuses and were visible to the public.

The Council was not represented, and the court granted the rule nisi.

STRAKER-SQUIRE TIP WAGONS.

Messrs. Straker-Squire inform us that they have just taken over from the Government a number of tip wagons of the type shown in the illustration, which were used in France and Belgium on road making work. These are being thoroughly overhauled and put in



good working order, after which they will be disposed of to intending purchasers. The machines, which were described in THE TRAMWAY AND RAILWAY WORLD (May 10, 1917), are fitted with Ruston and Proctor patent tipping body, for which many advantages are claimed.

A FILM TO PROMOTE BENZOL PRODUCTION.—In connection with the Automobile Association's campaign to promote the production of benzol a cinema film is being used. One statement upon which emphasis is placed is that one ton of coal, scientifically treated, will produce 2½ gallons of benzol, which is sufficient to drive a lorry 20 miles, a car for 40 miles, or a side-car 150 miles. In view of the great production of benzol by gas companies during the war there should not be any need to advocate the continuance. What is needed is to secure the sale at a price that will attract the consumer, and to show its capabilities in comparison with petrol.

GOVERNMENT LORRIES TO LESSEN RAILWAY CONGESTION.—Motor lorries are to be employed to relieve the congestion of traffic at the ports due to shortage of goods wagons and cartage facilities. The Government have placed at the disposal of the railway companies several hundreds of lorries, which will be allocated throughout the country. The drivers will be supplied by the Government.

WALSALL CORPORATION are purchasing a motor van at a cost of £250.

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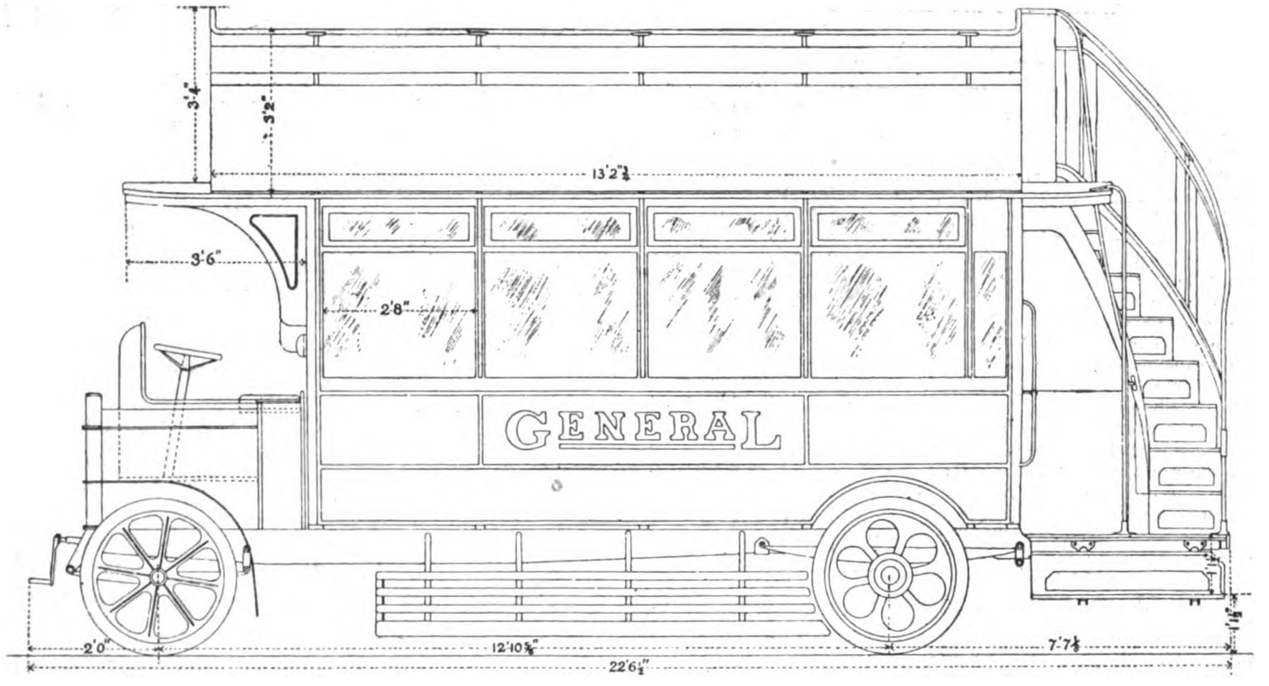
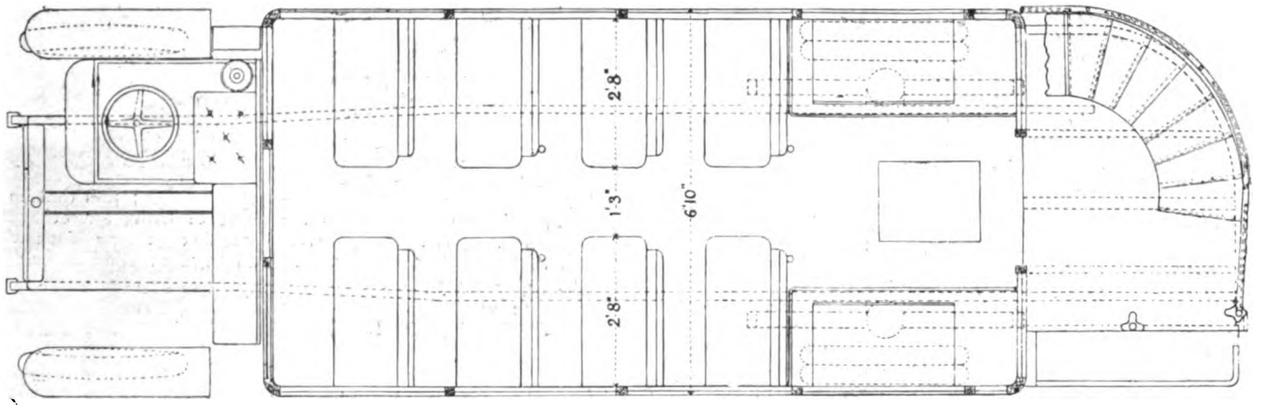
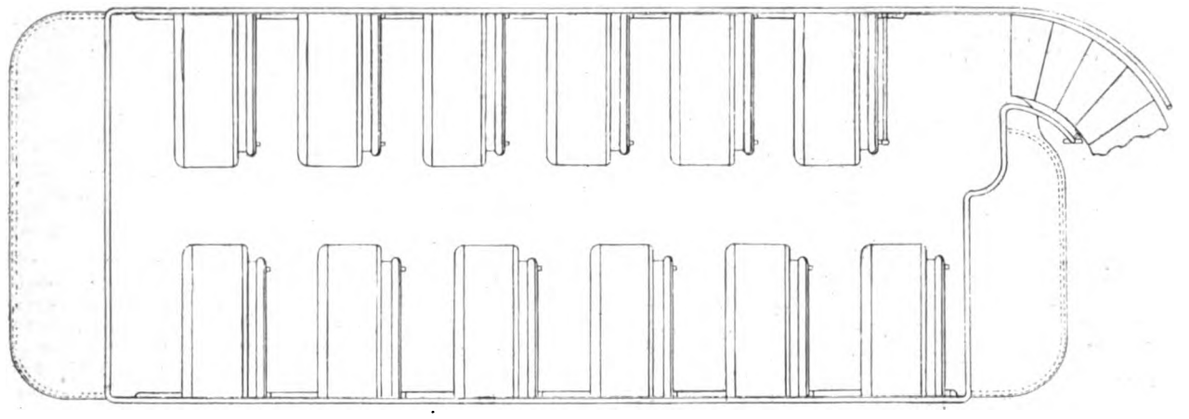
MOTOR TRAFFIC



Side Elevation.



Plan of Lower Deck.



Plan of Upper Deck.

Elevation and Plans of the More Commodious and Improved Type of London General Omnibus, Seating 46 Passengers.

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MOTOR TRAFFIC

THE SLOUGH INQUIRY.

REPORT OF THE SELECT COMMITTEE.

The Joint Parliamentary Committee have presented their report of the inquiry into the establishment of the motor depot at Cippenham, near Slough. At the inquiry 38 witnesses gave evidence. The Committee are of opinion that the decision to continue the works after the armistice was taken without sufficient consideration of the altered conditions, and without any trustworthy estimate of the financial results of the undertaking, and presented as a commercial proposition was not justified by the evidence given before the Committee. They think Lord Inverforth's action may prove to have been justified, but they feel that at the end of the period which it takes to repair the vehicles at Cippenham the Government should go into the whole matter.

No evidence was given that it was any longer necessary to continue the depot for war purposes only. As to the period before the armistice, the Committee find that the estimates of the vehicles to be overhauled annually for war purposes justified the size of the depot; that the trade were unable to undertake the repairs on the necessary scale; that though costly the buildings compared reasonably with other works; and that the Slough site was a good one. At the time of the armistice the work on the site was progressing slowly, and the whole question of the demobilisation and disposal of War Department vehicles was in the air.

The question at the time of the armistice, the Committee feel, should have resolved itself into a careful examination of what were the expenditure and commitments to date, with a view to a temporary halt in construction. Until the definite requirements of the after-the-war army took shape, it was impossible to make suitable provision for them, and it is probable that a solution might have been found by utilising one of the many factories built by the Government during the war. The housing arrangements for the workmen are found to have been inadequate, and as to the power house, the whole question of electrical supply required re-examination under the new conditions.

As to the cost, the Committee are of opinion that the estimate of £1,750,000, plus 15 per cent. and less estimated deductions, will be exceeded. They consider that the War Office might have examined at an earlier stage the possibility of selling the works, Lord Inverforth having stated that an offer to purchase at the cost plus a profit had been received. The question of continuance should have been considered when hostilities ceased. Lord Inverforth too readily accepted the estimates of large profits. The estimates should at once have been subjected to the independent scrutiny recommended by the Select Committee on National Expenditure. Had such scrutiny taken place when the armistice was signed, a different light would have been thrown on these estimates, and the whole future policy might have been different.

Adverting to the action of Lord Inverforth, the Committee conclude that at the time of the armistice, and while he was still surveyor-general of supply, his mind was already made up upon the future of the depot and the uses for which he projected it. The only expert body which considered the question of repairing army motor vehicles before sale, recommended (March 14, 1919) that no lorry should be repaired at a greater cost than £150, yet the disposal Board, which did not consist of motor experts, did not include this recommendation in forwarding the advisory Committee's report to the Council. Had this recommendation been adhered to, the Committee think it would have materially altered the commercial aspect.

It is too late now, the Committee state, to reverse what has been done. The costly factory, only partly completed, involves a commercial undertaking of which the financial aspects have been insufficiently considered. This undertaking is based upon a calculation of profit which was represented as its justification, but which is unlikely to be realised.

MANAGER OF THE A.E.C. TAKES CHARGE.

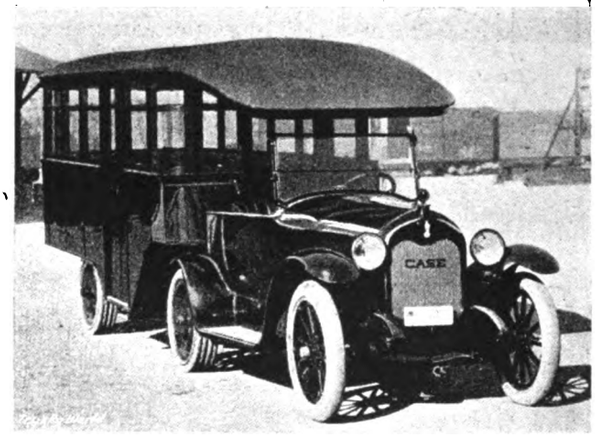
At the request of Lord Inverforth, Minister of Munitions, Mr. Samuel A. Wallace, manager of the Associated Equipment Company, has undertaken the task of putting the Slough depot into working order for the repair of discarded service vehicles and getting some return for the taxpayers' vast outlay. Mr. Wallace came to the Walthamstow Works of the London General Omnibus Company from Chicago, where he was manager of the General Electric Company, and he is rendering national service at Slough without remuneration. His supervision of the enterprise began on May 28, when the great shed in which work is going on was for the most part without a roof. In 30 days he got the repairing of vehicles actually in progress, and according to a statement made by himself 100 of them ready for sale are being turned out per week. The machines range from a motor bicycle to a 5-ton lorry. Upon the chassis of the four-wheeled vehicles from £120 to £200 is being spent, giving the finished product a value of from £600 to £800. When the factory is completed, which will probably be a matter of years, it will provide storage for 11,000 vehicles.

VALUE OF SALES ALREADY EFFECTED.

In the House of Commons on June 24, Mr. Kellaway, Parliamentary Secretary to the Ministry of Munitions, adverting to the sale of surplus stores, stated that motor vehicles sold up to date had realised £1,108,656. Referring to the scheme for the establishment of a motor vehicle depot at Slough, he asserted that whatever the verdict of the Joint Committee of both Houses might be on the past history of the project, this great engineering depot for the repair of motor vehicles was now serving a very important function. Having regard to the future of motor transport, a repairing depot on a very large scale was imperatively necessary in this country, whether under State or commercial management.

ONE-MAN OPERATED OMNIBUS.

The subjoined photograph illustrates a very light omnibus running on pneumatic tires in an American city. The chief features of the body are that it is built for operation by the driver



only; that he is fully protected from the weather; and that he is not shut off from assistance in the event of being overtaken by illness. Double-deck omnibuses are running in New York with bodies that provide for the second and third mentioned requirements.

L.C.C. OMNIBUS PROJECT.

OPPOSITION BY MUNICIPAL TRAMWAYS.

At a conference of local authorities owning tramways outside of the area of the London County Council, the following resolutions were passed:—

1.—That all the Councils represented at this conference be and are hereby urged duly to present petitions against the London County Council (Tramways and Improvements) Bill.

2.—That a sub-committee of this conference, consisting of the town clerk of each borough and clerk of each urban district here represented, together with one other representative of each area (to be selected by the council of such district), be and is hereby appointed to collaborate as to joint or uniform opposition on behalf of all the authorities to the proposals of this Bill, and

3.—That this conference recommends to all the Councils here represented that the broad lines of opposition to this Bill should be:—

(*a*) That no powers ought to be granted to any one authority to run omnibuses or in any way to interfere in the area of another authority, except with the consent of such authority, and in the event of powers being granted to London County Council to run omnibuses outside their own county, then each authority should have full control over the route or routes to be taken through its district.

(*b*) That the County Council should be placed under a statutory obligation to contribute a specified amount per mile towards the maintenance and general upkeep of the roads along which their omnibuses should run, and,

(*c*) That the grant of any such powers to the London County Council to run omnibuses outside the county should be entirely without prejudice to the rights of the respective authorities of the extra metropolitan areas to apply for similar powers.

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MOTOR TRAFFIC

THE WATCH ON THE RHINE.

The illustration given below is of interest from several points of view. In the first place it is a clear indication of the manner in which British troops keep watch and ward on the banks of the Rhine, and in the second place it affords an excellent example of the utility of the " Stevens " petrol-electric vehicles for the purpose

Searchlights on the Rhine Worked by Stevens' Petrol-Electric Vehicles.

of running powerful searchlights in positions far removed from a direct source of current supply. The machine shown is the Stevens standard 3-ton War Office subvention type, of which a large number have been supplied to the various Government departments, and 200 are working with the army on the Rhine.

THE CONCRETE ROAD.

For nearly two years the various States of the U.S.A. have been carrying out what has become the greatest scheme in the world of construction of new roads and the improvement of existing thoroughfares. The war has provided the main impetus to the movement, which was inaugurated by the Federal Government for the purpose of assisting motor transport to provide a relief to railway congestion. Acting on the experience gained for some years before the war, the engineers are using concrete for both foundation and surface in a large number of cases. The accompanying photograph gives near and long distance views of a concrete road upon which a number of military wagons are running.

An American Concrete Motor Road.

FIRST AIRSHIP FLIGHT ACROSS THE ATLANTIC.—In view of the epoch-making return of the R34 naval airship from its flight across the Atlantic, it is of interest to note that the Sunbeam engines were equipped with B.T.H. magnetos, which are all-British in design and construction, and have secured an enviable record during the war for reliability and efficiency.

OPERATING COST OF 5-TON TRUCK.

Answering a challenge made some time ago by an official of the Motor Truck Transportation Division, Bureau of Markets, U.S.A., Department of Agriculture, that " You don't any of you know how much it costs to operate a 5-ton truck here," the Motor Truck Owners' Association of Philadelphia prepared and sent out a comprehensive questionnaire of 37 queries to motor truck owners, aimed at obtaining just that information. What the association learned, as reported by the chairman of its investigating committee, C. B. Montgomery, transportation expert of the Union Paving Company, which operates a large fleet of dump-body trucks, is as follows :—

(1) The average daily cost of operation for a 5-ton truck, so far as could be ascertained from the sources called upon, amounts to $26·09, this applying to the dump-body type working under the conditions obtaining in the Philadelphia district.

(2) Fixed charge costs should be based on a 265-day year and not a 300-day year, as usually is the case.

(3) The general supposition prevailing in the territory that 50 miles a day is the average mileage for such a truck is erroneous, the actual average as worked out from the means at hand being only 40·5 miles a day.

(4) The sinking fund idea is apt to be a pitfall in making out truck operation costs.

(5) No one answering the questionnaire knew the speed of his truck on the day's work.

(6) The Government official who issued the challenge was right.

The average daily cost of operating a 5-ton truck was found to be as appended :—

Depreciation ...	$5·29	Garage fees	$ ·74
Interest	·76	Overhead expenses	1·74
Insurance	1·25	Driver	4·96
License	·11	Tires	2·29
Gasoline	3·42		
Oil and grease ...	·42		
Repairs	5·11	Total cost per day ...	$26·09

The items summarised in finding the daily average cost of operation are as follows :—Depreciation, interest, insurance, licence fee, gasoline, oil and grease, repairs, garage fees, overhead expense, driver's pay, and tires.

The Commercial Vehicle (New York) of June 1, publishes the full list of 37 questions submitted and gives an epitome of the answers.

WOLVERHAMPTON OMNIBUSES.—There was a profit for the year ended March 31 last of £1,609 on the motor chars-a-bancs which are run in connection with Wolverhampton Corporation Tramways.

Two hundred and fifty-two motor trucks built for war were on June 1 received by the Pennsylvania State Highway Department from the Federal Government gratis. The vehicles are to be used in connection with the improvement of roads under the Federal Aid plan.

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MOTOR TRAFFIC

MOTOR VEHICLES FOR MUNICIPALITIES.

Millom Urban Council have ordered a Robey steam wagon at £1,080.

Helmsley Rural Council have decided to purchase a motor wagon.

Rochester Council have accepted an offer of a government lorry at £510.

Rugby Rural Council have a report in favour of purchasing motor vehicles.

Manchester Corporation are purchasing motor wagons and a motor sweeper.

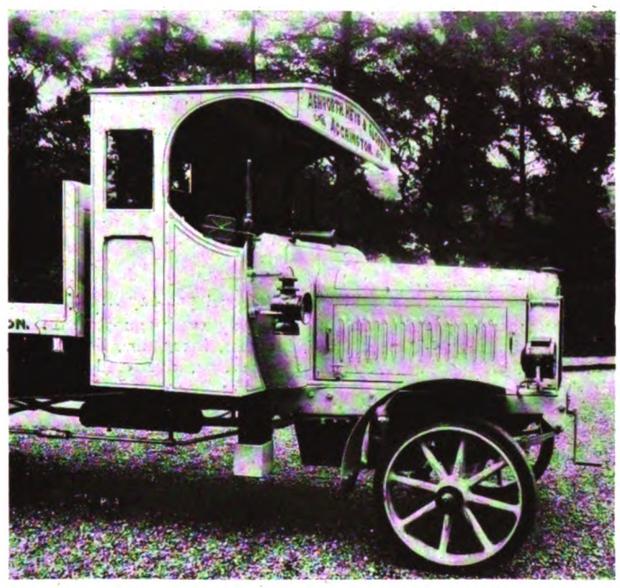
Derby Council contemplate purchasing a motor tank wagon for street watering.

Sidmouth Urban Council are to purchase a Foden steam wagon at a cost of £1,260.

Walthamstow Urban Council have purchased five steam wagons from the Government.

Margate Corporation have been advised to purchase four Foden steam wagons.

Torquay Council have called for specifications and tenders for the supply of a motor fire engine.



Covered Cab Adopted by the Leyland Company for Chars-a-bancs and Lorries.

Kendal Corporation propose to purchase at a cost of £690 a Merryweather steam fire engine.

Bournemouth Tramways Committee recommend the purchase of two additional omnibus chassis.

Derby Corporation are obtaining a second motor fire engine, a motor tender, and a motor prison van.

Heanor Council have ordered a 5-ton lorry, including a tank for street watering, from Fodens, Limited.

East Sussex County Council have authorised the purchase of two tractors and trucks at a cost of £3,500.

York Corporation have ordered two new Edison batteries for the omnibuses of the tramways department.

Wellingborough Rural Council are purchasing a steam roller and steam tractor, together with two trailers.

Glasgow Tramways Committee propose to obtain two 5-ton electric vehicles from Electromobiles (Leeds), Limited.

Gloucestershire County Council have agreed to purchase 20 steam lorries and ten petrol lorries fitted with tipping gear.

Birmingham Corporation have authorised the purchase of a motor car for the fire brigade department at a cost of £600 or £700.

Bradford Corporation have given an order to the Lacre Motor Company, Limited, for three street sweeping machines and sprinklers.

Hampshire County Council are purchasing four motor cars, at a cost not exceeding £1,600, for the use of the divisional surveyors.

Manchester Corporation have decided to spend £3,200 on the purchase of motor vehicles for use in the street cleansing department.

Southgate Urban District Council have applied for powers to purchase a number of electric vehicles for the purpose of dust collection.

East Ham Council have received a tender from Messrs. Crompton and Company for the supply of charging plant for battery driven dust vans.

Nottingham Corporation have decided to erect a garage at the Eastcroft depot with facilities for repairing their motor vehicles, which number 24.

Kensington Works Committee recommend the purchase of two Ford chassis for adapting for use as tipping wagons by means of the B.A.I.C.D. attachment.

Plymouth Corporation have referred to the Finance Committee a report recommending the purchase of two steam rollers and four steam wagons for street watering.

Leyton Urban Council propose to authorise the chairman of Tramways Committee and the tramways manager to purchase a motor chassis for their tower wagon.

East Ham Works Committee have received quotations for the supply of motor vehicles for general cartage work, and a sub-committee was appointed to deal with the matter.

Oldham Corporation have asked the Local Government Board to sanction a loan of £4,000 for purchasing a steam wagon, an electric vehicle, and a steam-propelled gully-emptying machine.

Haslingden Council have decided to obtain a 3-ton petrol wagon owing to the high cost of horses and labour. In 1914 the Council purchased a similar vehicle, but sold it in 1918 at a profit of £240.

Swansea Council have decided to purchase a light motor lorry, their surveyor estimating that the vehicle will effect a saving of £100 in the first year besides preventing waste of the employees' time.

Westminster Highways Committee have recommended the City Council to accept the offer of Messrs. John I. Thornycroft and Company, Limited, from among four tenders, for the supply of ten petrol motor wagons, at £1,075 per wagon.

Hackney Council have been advised to obtain a motor lorry, in order to convey their workmen and materials to the places of work. At present several hours are lost daily before men can get to their jobs, and they are paid for the time lost.

Essex County Council, which purchased a second-hand Garrett steam wagon for £400 in 1916, are having a new fire box fitted at a cost of £225. The Highways Committee say that the vehicle, which has already done useful work, will then be worth £700.

Norfolk County Council have been recommended by their surveyor to obtain steam wagons instead of petrol driven tractors, owing to the difficulty of haulage from many of the gravel pits. The Council have instructed him to obtain a steam tractor and wagon.

Chadderton Urban Council have adopted a report from a sub-committee recommending application for a loan for purchasing four motor vehicles for the removal of house refuse. This decision was come to after the sub-committee had witnessed the work of the refuse removal vans at Bury.

Blackpool and Motor Vehicles.—In his address at the conference of cleansing superintendents, Mr. James Bee, cleansing superintendent of Blackpool, stated that the saving effected by the use of motor vehicles when compared with horse haulage in street watering was at least £20 per week per motor.

Herefordshire County Council have received a report from their surveyor stating that the Robey tractor had been working 148 days at a cost of £1 11s. 4d. per day. On 110 other days it had stood idle through lack of supplies. It had travelled 1,444 miles at a cost of 7s. 1d. per mile, hauling 1,672 tons at a cost of 4s. 9d. per ton. The total working costs, including depreciation, insurance, and all charges, was £404. The surveyor added that if the work had been done by hired vehicles the cost would have been £547.

COMMITTEE ON CIVIL AVIATION.

The Air Ministry have appointed a Standing Advisory Committee on Civil Aviation with the following terms of reference :—"To advise and report to the Secretary of State for Air on the best method of organising imperial air routes, and on such other subjects relating to civil aviation as may be remitted to the Committee by the Secretary of State." The Committee consists of Lord Weir (chairman), Lord Inchcape, Sir James Stevenson (vice-chairman), Col. Moore-Brabazon, Mr. C. G. De Rougemont (chairman of Lloyds), Mr. H. White Smith, Mr. L. Bairstow, Sir Hugh Trenchard, Sir F. H. Sykes, and Sir Arthur Robinson (Secretary of the Air Ministry). The secretary of the Committee, which has power to co-opt additional members, is Mr. F. S. L. Bertram (Air Ministry).

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MOTOR TRAFFIC

MOTOR TRAFFIC NOTES.

"Safety First" Road Signs.—All future road signs of the Automobile Association will bear the words "Safety First."

Snow Screens for a Yorkshire Road.—At a cost of £1,000 the West Riding County Council propose to erect snow screens alongside the Wakefield and Austerlands main road in Standedge cutting.

Birmingham-Wolverhampton Road Scheme.—Dudley Corporation are submitting a scheme to the Road Board for the construction of a new road between Birmingham, Dudley, and Wolverhampton.

Birmingham-Barmouth Service.—Arrangements have been made by Mr. G. E. Tovey, of Erdington, to run a motor chars-a-banc weekly from Birmingham to Barmouth during the summer, and also Sunday trips in the district.

Mirrors for New York Trucks.—The Governor of the State of New York has signed a Bill which makes compulsory the fitting of a mirror to all trucks over one ton capacity, so that the driver may have a view of the road behind him.

Southampton-Totton Omnibus Service.—A company has been formed by residents of Totton to run an omnibus service to convey residents to and from their employment in Southampton and for week-end trips to the New Forest and Bournemouth.

Motor Lorries Required in Morocco.—The British Vice-Consul at Tetuan reports that business can be secured by British makers of motor lorries and accessories by writing to the Army Service Corps Department (Intendencia Militar), Tetuan, Morocco.

British Automobile Traction Company.—Mr. Sidney E. Garcke has resigned his position of managing director of this company in consequence of the demands on his services by certain associated companies. Mr. Garcke will continue to be a director of the company.

Omnibus Front Wheel Guard.—At an inquest on a child who had been run over and killed by a London General omnibus, it was stated that although the company had experimented continuously for some years past, no satisfactory guard had yet been found for front wheels.

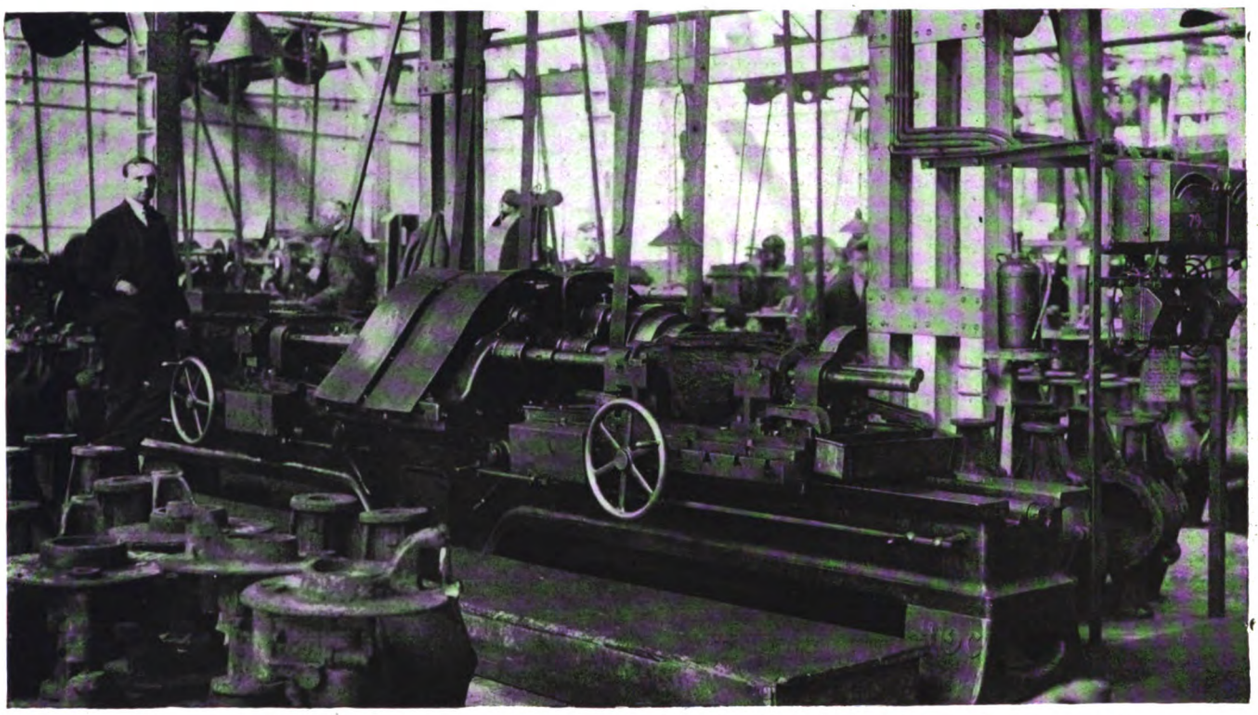
Omnibus Proposal for Frome.—The Urban Council of Frome have granted the Warminster motor omnibus services permission to run to Frome upon the same conditions as the Somerset and Wilts County Councils offer, i.e., upon payment of 3d. per mile travelled within the district.

The Storage of Benzol.—Under certain restrictions issued by the Home Office on June 26, it will be permissible to store 50 gallons of motor spirit out of 60 in a single receptacle, without a licence. This concession will remove what has proved to be a serious hindrance to the use of benzol.

Omnibuses Suggested for Southend.—A scheme is under consideration by Southend Light Railways Committee for providing further means of conveyance, either by an extension of the light railways or the institution of motor omnibus services, or by a combination of the two.

Omnibuses for Wallasey Corporation.—In the belief that the prices of motor vehicles will be as high a year hence as at the present time, Wallasey Corporation Tramways Committee have reconsidered their decision to defer the purchase of the motor omnibuses required by the department. The committee have asked the firms who recently tendered if their prices still hold good.

Metropolitan Demand for Resilient Tires.—The Metropolitan Boroughs Standing Joint Committee have forwarded a communication to the Local Government Board in favour of heavy motor vehicles being compelled to use resilient tires, despite of the statement in the report of the Departmental Committee on Heavy Motor Traffic that such a regulation could not be justified.



Simultaneous Boring of Four Axle Cases in One of the Associated Equipment Company's Machine Shops.

Training Omnibus Drivers for London.—Rapid progress is being made by the London General Omnibus Company in the training of drivers and conductors for the omnibuses now being added to the fleet. Within the last few months 1,751 ex-soldiers have passed through the company's training school—773 as drivers and 978 as conductors. A further 771 are now undergoing training.

Municipal Omnibuses for Edinburgh.—A sub-committee of the Edinburgh Tramways Committee recommends that motor omnibuses should be run on certain routes to supplement the tramway service. The Corporation have powers to operate omnibuses within the city boundaries, and the committee urge that the services should be inaugurated as soon as vehicles can be obtained.

The Dorman Engine.—Dormans, of Stafford, are now giving the whole of their attention to engine building for motor cars, and are prepared to construct thousands yearly for any car maker, either to special design or standard construction. The Dorman standardised engines are being placed on sale at garages throughout the country, thus enabling them to be easily fitted to reconstructed chassis.

Priority Cars for Wounded Men.—Complaint has frequently been made that wounded and disabled soldiers, even when in hospital uniform, have been roughly treated by persons desirous of boarding London omnibuses. In Paris the Prefect of Police has issued an order giving priority to wounded and disabled soldiers in using public conveyances on presenting a special card to the driver or conductor.

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MOTOR TRAFFIC

Post Office Purchase of Albions.—Thirty-six of the Albion Motor Car Company's War Department type of vehicles recently offered for sale by the Ministry of Munitions have been purchased by the General Post Office. Other large buyers secured all the remaining Albions which were released.

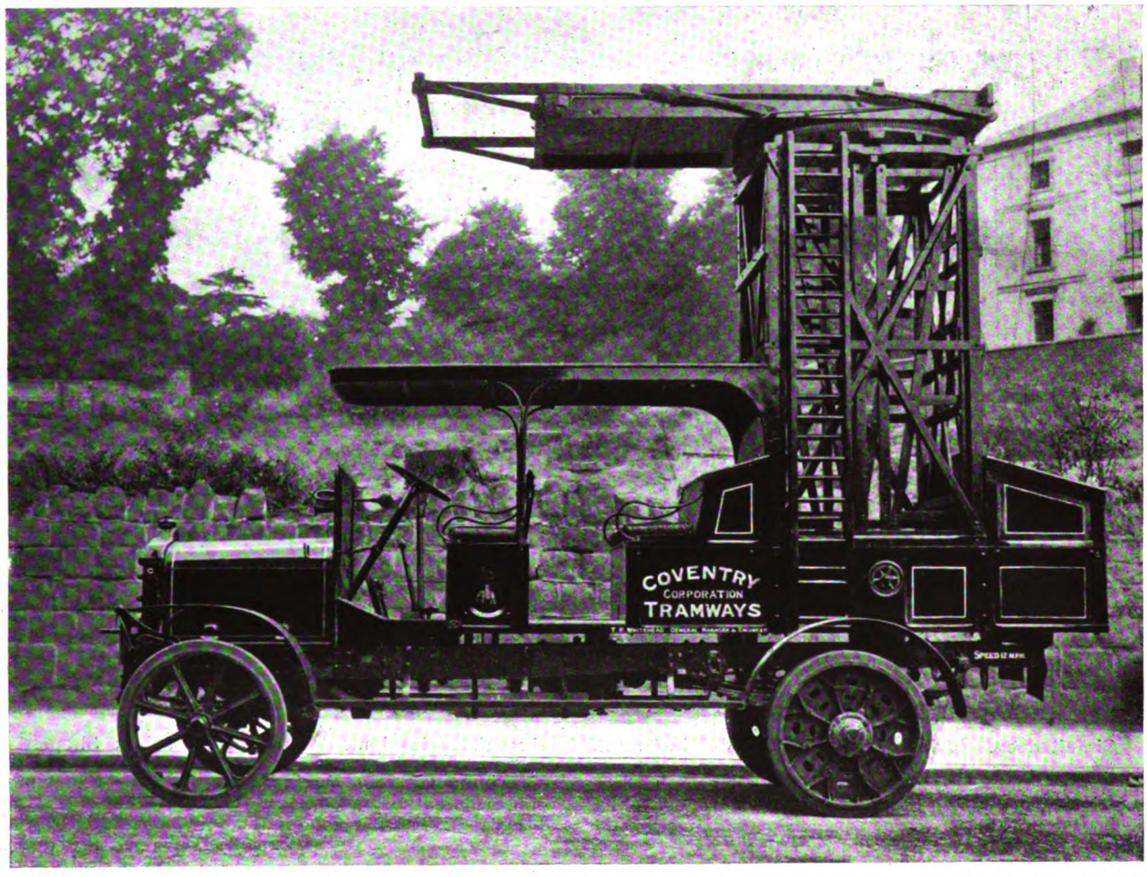
London Council's Plan to Meet Competition.—In reply to a letter received from the chairman of the House of Commons Committee on London Traffic, the Walthamstow Council have asked the local Member of Parliament to urge upon the Committee the necessity of granting the Council powers to run motor omnibuses in order to augment the tramway service, and to link up routes.

Extension of Great Western Services.—The road motor car department of the Great Western Railway has taken delivery of 32 new vehicles for passenger services and cartage work. At local request the department has started a service between Kingsbridge and Dartmouth. For nearly a century horse coaches had provided the service, but during the latter part of the war the firm operating them had to discontinue.

to Messrs. Walker Brothers, Wigan; one chassis to the Associated Equipment Company, London; and three bodies to the English Electric Company (Messrs. Dick, Kerr and Company), Preston. Councillor Walkden, chairman of the committee, has informed the Council that if the orders had not been given immediately delivery could not be guaranteed for at least three or four months.

Formation of a Research Association.—The Research Association of British Motor and Allied Manufacturers is in course of formation, with the support of a large number of leading firms. The association has been formed as a result of negotiations between the Association of British Motor and Allied Manufacturers, Limited, and the Government Department of Scientific and Industrial Research. It is hoped to establish a closer relationship between the technical and commercial sides of the industry, and to bring about more complete recognition of applied science.

Additional Omnibuses at Sheffield.—Ten new omnibuses have been put into service by the Sheffield Corporation Tramways Department, which has for over a decade recognised the utility of



A Tower Wagon on a Daimler 2-3 Ton Chassis, which has been taken into the Service of the Coventry Tramways.

Motor Garage and Petrol Storage at Sheffield.—The Sheffield city architect has been asked by the Corporation to prepare plans and estimates for the construction of a new garage on the land adjoining Worthing Road tramway depot. The Tramways and Motors Committee have approved the tender of the Steel Barrel Company, Limited, of Uxbridge, for the supply of a 1,000 gallon petrol storage installation complete, at £152.

Communication Between Cardiff and Newport.—While the scheme of the general manager of the Cardiff Tramways for the construction of a light railway to Newport has not yet got beyond the stage of suggestion, a Cardiff motor cab company is running chars-a-banc services to Newport. Five vehicles are to be employed, and the fare is three shillings for the out and home journeys, as is the case on the railway, with a shilling extra on Sundays.

Omnibuses for Wigan Tramways Department.—Orders have been given by Wigan Tramways Committee for two omnibus chassis

this vehicle for linking up outlying districts with the tramway termini. During the war the omnibus service was found to be invaluable for transporting munition workers. In four days at Whitsuntide this year the receipts totalled £1,559. The department has placed an order with the Brush Electrical Engineering Company for one single-deck omnibus body of a special design at a cost of £475.

Petrol Consumption on the Western Front.—Mr. A. G. Bedford, chairman of the Standard Oil Company, who rendered great service to the American Petroleum War Services Committee, entertained recently at luncheon in London, said that during the more strenuous days of the fighting in 1918 the Allied armies in France used 2,000 tons of petrol a day. In 1918 about 2,629,000 tons of fuel oil were shipped from the Eastern States for the Allied Navies in Europe. In America, but for the voluntary saving of oil on "petrol-less Sundays," one of the most anxious moments of the war in regard to petrol might not have been bridged.

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SATURDAY, JULY 19, 1919.

LIGHTER TRAMWAY CARS.

IT must be admitted that the tramcars now in use were designed with a prodigal disregard of weight factors. In the first flush of their newly-discovered wealth in electric power, tramway authorities built cars that a Dundee Town Councillor irreverently described as warehouses. Having taken that line, they proceeded to perfect the type, aiming at increased size and strength without taking thought of the other factors involved. Heavy and of great height the ordinary types of tramcars make big drafts upon the electric power supply, grind down the finest steel rails, and rack the best-made tracks within a comparatively short period. These cars have one merit, and that is a large passenger-carrying capacity. But could not two smaller cars with one deck, travelling at a higher rate of speed, carry more passengers at less cost than one double-deck car? Tramway authorities in the United States have put this question to themselves, and have answered it in a manner which they consider quite satisfactory. What has been named the "safety car" has there been constructed and put into service. It is in fact the outstanding traffic feature of transatlantic interest. A recent report of the American Electric Railway Association shows that there are at present eighty companies, serving a population of four millions, operating more than 2,500 "safety cars." In Kansas City exhaustive trials have been made, with the result that the "safety cars" show a saving, in comparison with larger cars, of 60 per cent. in power alone, and an increased earning capacity of 19 per cent. The saving effected all over is estimated at 25 per cent. A "safety car" is a single-deck car provided with various devices for securing freedom from accidents to passengers, and it has seating for 32 passengers, with standing-room for 28 people, giving a load of 60 passengers under congested conditions. As the new car is of light construction, it obviously requires less material for its structure; it also economises electric power and wear and tear of rails and track. Traffic conditions in this country differ greatly from those governing tramway operations in the United States, and therefore to carry comparisons into further details might lead to erroneous conclusions. There can be no question, however, about the capacity of the "safety car" as a passenger-carrying vehicle, and the subject ought to receive very serious investigation by British tramway authorities. It is possible that, by a change so simple as the adoption of lighter cars, the owners of tramway undertakings may find their increasing difficulties greatly minimised. If such were the result, it would not be the first time that the introduction of a simple change has overcome what seemed insuperable obstacles.

THE ELECTRICITY SUPPLY BILL.

VIEWS OF GLASGOW CORPORATION MANAGER.

In a report prepared for the Glasgow Corporation upon the Electricity Supply Bill, Mr. J. Dalrymple, the general manager of the tramways, says :

Some time ago I served on a Committee of the Municipal Tramways Association which considered the new proposals from the point of view of those municipalities which had separate generating stations for their tramway requirements. The general opinion seems to be that, from a national point of view, the proposals are sound but, in matters of detail they require to be carefully considered.

The Tramways Committee are, of course, specially interested in the provisions of the Bill, in so far as they affect the position of Pinkston Power Station and the high-tension transmission lines from the power station to each of the six sub-stations.

Pinkston Power Station was opened in 1901, and is thus 18 years old. It was originally designed and equipped to provide current for a larger number of cars than are yet in service, so that we have always had an ample supply of power. The station was originally equipped with reciprocating engines, but for some years the whole load has been taken by three turbo-generators of 3,000, 5,000, and 6,000 kw. capacity respectively, which were subsequently installed.

In addition to the power station it is proposed, under the new scheme, to take over the high-tension transmission lines. The cost of these has been considerable, but I cannot, at the moment, give the figures, as these are so much mixed up with the cost of the low-tension distribution system. The total capital cost of generating and distributing the current for the Tramways may be stated as under :—

Power Stations	£525,268	4 5
Ducts and Manholes ..	222,355	10 6
Feeder Cables	292,347	6 7
Sub-Stations	137,235	13 11
	£1,177,206	15 5

In connection with the proposal to take over the above plant, one very important point for the committee to consider is that the whole capital cost, as above, has been entirely wiped off, so that the Tramways Committee are able to generate and distribute current for the cars at a very low rate per unit; in fact, the cost per unit is now practically works cost only. If the station is ultimately taken over the committee will require to consider, first of all, what sum the Corporation should receive for same and, secondly, at what rate the tramways should be charged for current by the new authority.

One naturally asks what is likely to be done with a magnificent station such as Pinkston, which is thoroughly up-to-date, and has always been recognised as one of the most efficient and economical stations in the country? It would surely be very bad business to scrap such a station especially when we consider what it would mean to provide new plant at present prices.

The proposal to take over the high-tension distribution system requires very careful consideration; in fact, such a proposal should be strongly opposed. Our high-tension lines and our low-tension lines must be operated by the same authority. It would never do to have the employees of two independent authorities working in the same manholes; one set of employees at the high-tension and the other set at the low-tension feeders. Such an arrangement would lead to endless trouble. Some scheme must be devised under which one authority will be responsible for the whole distribution.

Up to the present the generation and distribution for the tramways has worked with perfect smoothness and efficiency, in great measure because the same authority which operated the tramways generated and distributed the electric current. The Corporation were thus able to make ample provision for their requirements. What the position will be should the supply of electricity be in the hands of an entirely independent body it is hard to say, more especially if that body is practically a Government Department.

Halfpenny Fares in Glasgow.—Glasgow Town Council has again deferred a decision on the proposal that halfpenny fares should be abolished. The Town Council are disinclined to make the change, as they are fully aware of the great importance of the halfpenny fare to the workers. It seems hardly possible, however, that the change can be long postponed.

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LONDON TRAFFIC ENQUIRY.

At the sitting of the Select Committee appointed to enquire into London traffic conditions, held on Tuesday, July 8, evidence was submitted on the taxi-cab traffic of the metropolis. Mr. F. W. C. Ashwood, traffic manager of the British Motor Cab Company, stated that there were 9,500 taxi-cabs on London streets before the war, and now the number was 4,500. The principal reason for the reduction was that the business could not be made to pay under present conditions. His company had lost £30,000 in 1917. In reply to the chairman's statement that the omnibus companies bought petrol at 2s. 1½d. per gallon, Mr. Ashwood said he wished he could get it at that price. He was quite satisfied with the speed limit in the town, but thought 20 miles not a great speed in the country. He was not in favour of employing women drivers. Mr. de Jarney, general manager of the British Motor Cab Company, saw a great future in the development of the hire-purchase system as applied to motor vehicles.

Mr. Ben Smith, organising secretary of the Licensed Vehicle Workers' Union, argued that, in the interests of equality, the charge for taxi-cabs should be increased. He was not in favour of women taxi-cab drivers. The average takings of a taxi-cab in London per day was between 30s. and 35s. on the clock, and 5s. to 6s. in tips.

Superintendent R. J. Halford, of the City of London Police, said the routes of omnibuses were arranged by the police, and the present routes had proved satisfactory. He strongly deprecated the introduction of tramways across Ludgate Circus.

Mr. C. S. Louch, accountant to the London Traffic Combine, was questioned at length regarding the finances of the concern, and he argued that the combine had the right to fix fares to enable it to earn an ordinary commercial return on its capital.

Mr. G. J. Shave, engineer of the London General Omnibus Company, was of opinion that trailers on omnibuses would be of no advantage and a danger to passengers.

Mr. C B. Burdom, secretary of the Garden Cities and Town Planning Association, was of opinion that the traffic difficulties were largely caused by over-centralisation of industry. He advocated a central authority to control traffic, housing and town planning throughout the country.

On resuming its sittings on Thursday, July 10, the Committee heard evidence from Mr. Sidney A. Parnwell, assistant general manager of the Great Eastern Railway dealing with the congestion of the railways, the closing and re-opening of stations, excursion trains, passenger fares, and season tickets. Mr. Parnwell stated that his company had in view electrification of their suburban lines, but the Ways and Communications Bill made individual companies hesitate about incurring large expenditures. He objected to the phrase "sitting tight," as descriptive of their attitude, but admitted they were doing nothing in regard to electrification of lines. The addition of 50 per cent. on passenger fares had led to an increase of 50 per cent. in the number of season ticket holders on the Great Eastern suburban lines.

Mr. H. H. Gordon, L.C.C., gave the opinion that the motor omnibus was best where traffic was not too dense, but that the tramcar was best where traffic was densest. He would greatly extend the London tramway system and join up dead ends. At present there was no statutory obligation on anyone to do anything for London traffic, and an authority should be set up. He suggested that the authority should consist of three members elected by the London County Council, and three by the extra-London authorities, with a chairman appointed by the Government. This Traffic Board should own the means of transit and operate them in the interests of the public.

On Tuesday, July 15, Lord Claud Hamilton was the first witness, and in the course of his evidence explained that the main cause of the taxi-cab difficulty was the dilatoriness of the Home Office in giving a decision on the question of increasing fares by 50 per cent., and their final refusal to ratify the arrangement which had been agreed upon by both drivers and owners.

Mr. H. H. Gordon, L.C.C., continuing his evidence, said that London traffic required a general speeding-up. It was desirable to link up all traffic under one control. In regard to tramways, the witness did not think a broad enough view had been taken of the subject. He did not consider running tramways through narrow streets objectionable, and in regard to Fleet Street fewer tramcars than omnibuses would be required to deal with the traffic. The witness considered that street maintenance of tramways should be paid by the local authorities.

M. C. S. Louch, accountant for some of the Combine companies, questioned regarding what was called "watered stock," declined to express an opinion on the subject.

Mr. Vernet, a director of the Underground Electric Company, questioned on the same subject, replied that he did not regard the stock referred to as "watered." The General Omnibus Company paid 8 per cent. free of tax last year, or about 11 per cent.

Hearing of evidence was concluded on Thursday, when the first witness was Mr. Herbert Morrison, secretary of the London Labour Party. His main idea was a capital levy by the Treasury, the money to be used according to the needs of localities, the loans to be without interest, but repayable to the Government.

Mr. G. W. Flood, representing the London and Suburban Passengers' Association, gave evidence in favour of the creation of a traffic board with a radius of administration and control extending 20 miles.

Mr. W. Murray, tramway manager for the Walthamstow Urban District Council, said traffic had long outgrown the service, and it was suggested that motor omnibuses should be run in conjunction with the services. The tramway authorities should be granted a monopoly, if they are able and willing to give the required facilities.

Mr. H. I. Wakeam, county engineer of Middlesex, suggested an independent popularly-elected board of control, which would manage all the traffic, lay down routes, and deal with licensing.

L.C.C. TRAMWAY MATTERS.

At the meeting of the London County Council on Tuesday among other reports brought up by the Highways Committee were the following :—

LOSS ON ALL-NIGHT CAR SERVICES.—All-night car services are at present run on nine routes. The receipts for the five weeks ended July 2 were £325 15s. 4d., an average of 10.64d. a car mile. For the corresponding period in 1918 the receipts were £181 12s. 9d. or 5.93d. a car mile. The weekly car mileage was 1,470 miles. During the year ended March 31 last, the average receipts per car mile were 6.19d. Calculating the operating expenses at 14.27d a car mile, the loss on working the night services was 8.08d. a car mile, or about £2,586. In their report on the subject the Highways Committee pointed out, however, that the figure of 14.27d. a car mile was based on the total car mileage run on the whole system throughout the year, while the actual cost of working the night-services is greater than the average cost of running. The all-night services have always been run at a loss, but have been continued in view of the public convenience afforded. No similar services are provided by the omnibus companies or by any other metropolitan street passenger authority.

PEACE CELEBRATIONS.—The Council approved the report of the Highways Committee, recommending that the following arrangements should be made in connection with the peace celebrations on July 19.

(i) As many employees as possible on the operative staff of the department to be given leave of absence with pay on Saturday, July 19.

(ii) Employees who are required to remain on duty on July 19, to be paid at the rate of double time on the basis of an eight-hour working day, and to be granted an extra day's holiday with pay.

(iii) Employees whose "stand-off" day falls on July 19, or who are absent on leave or through sickness to receive an additional day's pay on the basis of an eight-hour working day.

The cost of these arrangements will amount to about £13,000.

TRAMWAY EXTENSION SCHEMES.—The Highways Committee reported that they had under consideration a number of proposals for linking up the tramway termini and for otherwise consolidating and extending the present system. In view of the present congestion of traffic, the Committee consider that it is important that there should be no avoidable delay in dealing with the schemes for improvement, and they recommend that such of the proposals as require Parliamentary sanction should be considered in the session of 1920. They advised therefore that the operation of the Council's standing order be suspended, and that they should be authorised to submit after the summer recess proposals to be submitted to Parliament in the session of 1920.

EXPENDITURE BY HIGHWAYS COMMITTEE.—The Highways Committee reported that they had sanctioned the following expenditure :—Purchase of articles for tramway maintenance purposes and the execution of small works and repairs, £175,235 12s. 1d.; purchase of metals, £6,603 14s. 4d.; purchase of timber, £11,861 17s. 4d.; purchase of 200 tons of pulp middle, £6,250; purchase of track rails, £6,000; horsing of tower wagons required in connection with the inspection and repairs of overhead trolley wires, £1,500; purchase of 200 right hand and 200 left hand main brake levers, £8,900; Guernsey granite setts, £12,350; quarterly inspection and testing of weighbridges and weighing machines, £100; rewinding armatures, £9,000; steel tires, £32,285; six 4-ton petrol lorries, £5,463 (with an additional £30 provisional sum); hire of horses and carts, £4,500; supply of field coils, £5,411 17s. 6d.; wood paving blocks, £12,000; track insulators and porcelains, £5,532 5s. 10d.; rolled steel bar for magnet brake shoes, £16,065; and cotton covered copper wire, £14,410.

ACCIDENT CLAIMS.—During the quarter 719 claims against the Council in respect of accidents were settled, the total expenditure being about £3,717. There were 75 other actions brought against the Council. In 7 of these the verdict was given against the Council, and £415 had to be paid. Eleven actions resulted in the Council's favour, the remaining cases being settled by negotiation.

Omnibus Powers for Swansea.—The Tramways Committee of Swansea Corporation have agreed to the principle of applying for Parliamentary powers to enable the Corporation to run motor omnibus services.

Leyland Omnibuses for Birkenhead.—Many members of the Birkenhead Council made a trial trip last week in the new Leyland motor omnibuses which have recently been purchased by the Corporation, when a number of parks were visited. The new omnibuses were put in service on July 12. At present the routes are confined within the borough, as the Council would have to come to terms with the District Councils concerned and the County Council for the use of the roads. Some of the District Councils have asked for 3d. a mile, which Mr. H. Halsall, chairman of the Tramways Committee, said would "about kill it." Other Councils had agreed to charge ¾d., ½d., and even ¼d. a mile. The new omnibuses can develop a speed of 35 miles an hour, and will run 7 to 8 miles on a gallon of petrol.

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HEADS OF TRANSPORT DEPARTMENTS.

At the close of his speech on the third reading of the Transport Bill in the House of Commons, Sir Eric Geddes announced the names of the heads of the various departments to be constituted under the Bill. They are as follows:

CIVIL ENGINEERING.—Sir Alexander Gibb, K.B.E., chairman, Easton, Gibb & Son, Ltd., and chief engineer of ports of construction to British armies in France and Belgium, etc.

MECHANICAL ENGINEERING.—Lieutenant-Colonel L. Simpson, D.S.O., formerly traffic superintendent for the Buenos Aires and Pacific Railway, and now chief mechanical engineer in charge of railway equipment for the British armies in France.

CONSULTING MECHANICAL ENGINEER.—Sir John Aspinall, late general manager of Lancashire and Yorkshire Railway, and associate professor of Railway Engineering in Liverpool University.

TRAFFIC DEPARTMENT.—Sir Philip Nash, K.C.M.G., locomotive engineer to the Great Northern Railway Company, and deputy-director-general of Transportation to the British Expeditionary Force during 1916.

FINANCE AND STATISTICS.—Sir George Beharrell, D.S.O. formerly assistant goods manager for the North Eastern Railway Company, and leading statistical officer in various Government war services.

DEVELOPMENT DEPARTMENT.—Rear-Admiral Sir Charles Martin de Bartolome, K.C.M.G., late third sea-lord and controller at the Board of Admiralty.

PUBLIC SAFETY AND LABOUR.—Sir William Marwood, K.C.B., served in the Post Office and Board of Trade departments, and has been employed in various transport enquiries.

ROADS DEPARTMENT.—Brigadier-General Sir Henry Maybury, K.C.M.G., formerly County Surveyor of Kent, and now manager and secretary of the Road Board.

SECRETARIAL AND LEGAL.—Sir R. F. Dunnell, K.C.B., secretary and solicitor to the North-Eastern Railway Company.

MISCELLANEOUS NEWS AND NOTES.

A Doctor's Privilege.—In response to a request by the Medical Faculty, Glasgow Corporation Tramways Department has issued a special permit to registered doctors, allowing them to board cars which may be carrying a full complement of passengers.

Coal Prices Order.—In accordance with the arrangement proposed by Mr. Bonar Law in the House of Commons on Monday, the Board of Trade have made an Order postponing for the present the operation of the Coal (Pit's Mouth) Prices Order, 1919, increasing the price of coal by 6s. per ton.

Triplex Safety Glass Approved for Cabs.—In reply to a letter in regard to the use of Triplex safety glass in substitution for ordinary glass at present used on public vehicles, the Commissioner of Police for the Metropolis has informed the Triplex Safety Glass Company, Ltd., that the police will raise no objection to its use in cabs.

"Lorribuses" Lose £1,500 Per Week.—The London General Omnibus Company have decided to discontinue the non-stop runs of the "Lorribuses," and to allow them to halt at all ordinary omnibus stopping points. There are now 168 of these vehicles in service. The company estimate the loss on each at 5d. per mile or £1 10s. per day, the net loss being £252 per day, making a total of £1,500 per week.

Railwaymen Strike at Carlisle.—On Monday night, the drivers and firemen on the North-Eastern Railway at Carlisle came out on strike, the alleged cause being the suspension of a driver who was said to have failed to pass satisfactorily the test for eyesight. Goods traffic between Newcastle and Carlisle on the North-Eastern line has been stopped, and after holding a meeting the men resolved to remain out until the driver has been reinstated.

Edinburgh Extensions.—The question of the proposed extension of the tramways to Liberton, Colinton and Davidson's Mains, suggested in the recent report of the tramways manager, was discussed last week at a meeting of the Tramway Sub-Committee of Edinburgh Town Council. The proposed omnibus routes outside the city boundary were also considered, but the Sub-Committee postponed a decision until they had visited the proposed routes. After doing so they will no doubt make recommendations to the Tramways Committee.

Tramway Industrial Council for Scotland.—A meeting of representatives of the municipal tramways in Scotland was held in the City Chambers, Edinburgh, on July 11, at which Mr. Peter Fisher, general manager of Dundee City tramways, presided, to consider the appointment of a reresentative to the National Joint Industrial Council for tramways. It was the general opinion that it would be better to form a purely Scottish Industrial Council, and it was decided to ascertain if the companies and their employees were favourable to the proposal.

Appreciation of Women Conductors.—Walthamstow was the first of the Metropolitan tramway undertakings to employ women conductors, and it has also been the first to release them to make way for men returning from service with the colours. The first women conductors started in November, 1915, and the last of them left the service on May 14, 1919. As a mark of appreciation the Tramways Committee are issuing to the women conductors a neatly printed brochure, containing a record of their services, which is signed by the chairman of the Tramways Committee, Councillor Clarke, and the tramways manager, Mr. William Murray.

No Increased Fares at Chatham.—In an interview with a local press representative, Mr. W. Jensen, general manager of the Chatham and District Light Railway Company, said: "We will not increase fares until our running expenses compel us to ask the public to support us in increased minimum fares. We want to continue our policy of giving the public service at the fares that have always been in force as long as we can."

Transport Workers Demand Another Increase.—An increase of ten shillings weekly for adults, and five shillings for youths, employed in horse, mechanical, and all forms of road transport in Great Britain, a fortnight's holiday with pay for all commercial road transport workers, payment for statutory holidays and higher overtime rates, are among the fresh demands put forward by the National Transport Workers' Federation in a letter to the Ministry of Labour. So recently as March 20, the hours were reduced to 48 per week in most cases without reduction of pay. The full agreement was given in our issue of April 10.

Peace Day Pay for Employees.—At a joint meeting of the Municipal Tramways Association, the Tramways and Light Railways Association, and the National Transport Workers Federation it was suggested that double time should be paid to all employees who were to be on duty on July 19, the day of the peace celebrations, and that those employees should be granted an extra day's holiday with pay, such extra day's holiday being added to the annual holiday wherever possible. This proposal, emanating from the Workers' Federation was unanimously approved at the meeting, and will, we understand, be generally adopted.

An Overcrowding Case.—At Leeds Police Court, last week, an assistant schoolmaster was summoned for remaining on a tram-car without the permission of the conductor and also for obstruction. According to the regulations, a conductor may refuse permission to passengers to stand in the car. In this case, the conductor requested the schoolmaster to step off, and the car was delayed several minutes because of the latter refusing to obey the conductor. After hearing evidence, the magistrate decided that there had been a technical infringement of the regulations, and dismissed both summonses under the Probation of Offenders Act.

Effect of Increased Fares at Birkenhead.—Twenty-four miles of single track and 65 cars are now controlled by the Birkenhead Tramways Committee. The undertaking has so far cost £370,000, but in nine years it will be entirely free from debt. The chairman recently said that when fares were increased passengers decreased by 60,000 in the first week, but the decrease had diminished to 20,000, while the receipts had grown by £700 a week. The increase in fares was made necessary by the increased wages bill due to the 8-hour day and the 6-day week, which required the employment of forty more men. The annual wages bill had grown from £20,000 to £52,000.

Strong Action Against Women Conductors.—A serious statement in regard to the employment of women conductors was made by Dean of Guild Meff, convener of the Aberdeen Corporation Tramways Committee, to the Wages Committee of the Town Council. He had received a letter from the Association of Discharged Soldiers and Sailors conveying the threat that, if women conductors were not discharged at once, they would be taken off by force on the day of Field-Marshal Haig's visit to the city, Friday, July 11. After consultation with the general manager of the tramways, it was decided to give the women conductors a holiday on the day in question, and to announce that the women conductors would be discharged within about two months.

Liverpool Fares.—A resolution recently adopted by the Liverpool City Council, under which a passenger would be able to travel only one and a half miles for a penny instead of two miles as hitherto, has been carried into effect on certain routes. For instance, the fare from Sefton Park to the Pierhead is now 1½d. instead of 1d., and from Garston to the Pierhead 4d. instead of 3d. The Tramways Committee has sympathetically received a deputation from the Education Committee, which asked that facilities might be given for the conveyance on tramcars of children from the city's congested districts to the parks. It was pointed out that in certain of the schools in the city there were children who had never been in one of the Liverpool parks. The Education Committee propose to make a grant for the purpose if the Tramways Committee will agree to convey the children at reduced rates.

English Electric Company, Ltd.—The offer this week of a final issue of £1,111,100 sinking fund 5½ per cent. mortgage debentures of the English Electric Company, at the issue price of 94 per cent., marks the completion of an important amalgamation. The company was formed in December last with a capital of £5,000,000, and is an amalgamation of five well-known undertakings, the Coventry Ordnance Works, Dick, Kerr and Company, the Phœnix Dynamo Manufacturing Company, the United Electric Car Company, and Willans and Robinson, whose average net profits for the past four years amount to £338,400 per annum. The net surplus of all fixed and liquid assets over all liabilities is £2,309,732. Since the armistice orders amounting to £1,500,000 have been secured, and with the combined resources of the individual concerns the group will undoubtedly form a very important factor in electrical engineering development. It is expected that the export business will continuously expand, and when fully organised the works will be capable of turning out orders to the value of between three and four million pounds per annum. The joint managing directors, Colonel Sir John Herbert Mansell, Mr. Percy Pybus, and Mr. Walter Rutherford anticipate that there will be no difficulty in filling the order books of the company.

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PERSONAL.

Mr. Wm. Debney, chief assistant to Mr. Chas. Brownridge, Borough Engineer, Birkenhead, has accepted an important appointment on the staff of Messrs. C. P. Sandberg, Consulting Engineers, Westminster.

Mr. T. R. Sykes, who, as mentioned in last week's issue, has been appointed manager of Rotherham Corporation Tramways, will receive a salary of £500 per annum. The tramway system has a route length of over 11 miles, and there are 4½ miles of overhead railless lines. There are 36 tramway cars besides railless vehicles and several petrol omnibuses.

Southampton Tramway Management.—Twenty-four applications have been received for the position of general manager and engineer of Southampton Corporation tramways. The Committee have recommendedthat four candidates be interviewed, viz., Mr. A. B. Slater, general manager, Burton-on-Trent Corporation tramways; Mr. J. Dobson, general manager, Gravesend and Northfleet Electric Tramways Company; Mr. Charles Burgess, general manager and engineer, West Hartlepool Corporation tramways; and Mr. J. F. Cameron, engineer and general manager, Northampton Corporation tramways.

Mr. J. Wilkinson, electrical engineer of Hull Corporation Tramways, has tendered his resignation, owing to ill-health. Mr. Wilkinson, in intimating to the Tramways Committee his desire to resign, expressed his regret at severing a connection lasting nearly twenty years, but his health had been failing during the past two years and he felt he could not carry out his duties as he desired. He would assist the new general manager to the best of his ability, and remain as long after his three months' notice expired as the Committee wished. The Tramways Committee have regretfully accepted Mr. Wilkinson's resignation, and deferred for consideration the fittest way of showing appreciation of his long and efficient service.

FINANCIAL.

Dublin United Tramways.—An interim dividend for the half-year of 5 per cent. per annum (5s. per share) less tax, has been declared on the ordinary shares. A year ago the rate was 4 per cent.

Swansea and Mumbles Railway.—An interim dividend of 9 per cent. per annum (7s. 6d. per snare) less tax, is announced on the ordinary shares for the past half year.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended July 16 amounted to £80,714, an increase of £16,756 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to July 16 (fifteen weeks and two days) the total receipts were £1,242,465 an increase of £291,958 on the corresponding period of 1918.

Belfast City Tramways.—As mentioned in our issue of July 5, Belfast City tramways, for the year ended March 31, 1919, have paid into the General Purposes fund £8,961. The actual surplus for the year was £29,230, which creates a record for Belfast. This is greatly in excess of the previous highest result, which was obtained in 1912. If the fares and stages at present in force had been in operation a full twelve months, it is estimated that the revenue would have shown an increase of £111,000, or a total of £466,000 for the year. The general manager, Mr. J. S. D. Moffet, estimates that the revenue is £516,000. The summary appended, which compares the results for 1914 and the past four years, shows the remarkable improvement that has been effected.

Year ending March 31.	1919.	1918.	1917.	1916.	1914.
	£	£	£	£	£
Total Revenue	406,301	355,056	301,345	280,653	272,062
Working Expenses:					
Traffic	121,218	102,582	82,115	74,589	77,949
General	29,207	25,678	23,876	23,159	12,593
Repairs and Maintenance	52,440	43,031	36,014	28,254	41,455
Power	54,289	50,676	47,660	33,308	28,281
Total Working Expenses	257,163	221,967	189,665	159,310	160,278
Gross Profit	149,138	133,089	111,680	121,343	111,784
Interest	50,549	50,549	50,501	48,352	48,342
Sinking Fund	43,509	42,882	43,937	41,396	40,315
Income Tax and Sundry Charges	8,850	4,221	7,134	6,554	3,223
Depreciation	17,000	17,000	17,000	17,000	17,000
Surplus	29,230	18,437	6,892 *(Deficit)	7,861	2,904
Track Mileage	100	100	100	100	100
Car Mileage	5,254,482	6,279,072	6,245,012	6,077,658	6,865,591
Passengers Carried ..	74,594,051	75,416,816	69,582,066	64,697,292	63,131,828
Total Revenue per Car Mile	18.56d.	13.57d.	11.58d.	11.08d.	9.51d.
Average No. Passengers per Car Mile ..	14.19	12.01	11.14	10.65	9.19
Energy Consumption (units)	8,878,855	10,249,611	10,077,955	10,080,540	11,000,708

*This deficit of £6,892 in 1917 was charged against the surplus of £18,437 for 1918

CONTRACTS AND ORDERS.

Sale of Old Setts.—The London County Council have disposed of fifty tons of old setts at £1 6s. a ton to the South Metropolitan Gas Co.

The Auto-Ticket Printing Company, of Liverpool have received an order from Bradford Corporation for the supply of tramway tickets for a period not exceeding three years.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C. ..	July 8	495	558	+ 63	14	7,581	+ 329
Aberdeen Corporation ..	„ 9	2,555	3,282	+ 727	5½	18,487	+ 3,681
Ayr Corporation ..	„ 12	874	936	+ 62	8	5,861	+ 1,133
Belfast City	„ 4	7,619	10,323	+ 2,704	14	143,367	+ 37,455
Birkenhead Corporation	„ 13	2,150	2,896	+ 746	14½	40,186	+ 8,188
Birmingham Corporation	„ 5	23,559	24,890	+ 1,331	14	360,634	+ 39,901
do. Motor Buses	„ 5	1,631	1,527	— 104	14	24,276	+ 3,365
Blackburn Corporation ..	„ 9	1,734	2,471	+ 737	15½	36,642	+ 9,240
Bradford Corporation ..	„ 5	9,726	11,038	+ 1,312	14	158,029	+ 30,366
Burnley Corporation ..	„ 12	2,373	2,872	+ 499	..	..	..
Burton-on-Trent Co. ..	„ 13	406	486	+ 80	15	7,122	+ 1,207
Bury Corporation ..	„ 13	2,023	2,370	+ 347	14½	36,606	+ 6,165
Chatham & District ..	„ 3	1,444	1,595	+ 151	26	37,347	+ 4,528
Cork Electric	„ 3	756	742	— 14	26	16,197	— 219
Derby Corporation ..	„ 12	1,488	1,981	+ 493	15	28,443	+ 6,212
Dundee City	„ 9	1,866	2,617	+ 751	7½	19,778	+ 4,626
East Ham Corporation ..	„ 12	1,533	1,913	+ 380	14½	28,459	+ 7,077
Glasgow Corporation ..	„ 12	27,599	32,111	+ 4,512	6	197,944	+ 19,196
Glossop (U.E. Sup. Co.) ..	„ 12	167	217	+ 50	23	6,259	+ 1,178
Halifax Corporation ..	„ 8	2,687	3,285	+ 598	14½	51,621	+ 12,631
do. Motor Buses ..	„ 8	61	79	+ 18	14½	1,169	+ 204
Huddersfield Corporation	„ 12	3,638	4,780	+ 1,142	15	73,277	+ 17,188
Ilford U.D. Council ..	„ 12	1,024	1,249	+ 225	14½	18,588	+ 3,910
Ipswich Corporation ..	„ 12	809	955	+ 146	15	13,257	+ 2,387
Isle of Thanet	„ 9	372	1,676	+ 1,304	40½	23,639	+ 15,063
Kilmarnock Corporation	„ 12	243	272	+ 29	8½	2,413	+ 413
Lanarkshire	„ 3	3,958	4,142	+ 184	26	88,492	— 3,192
Leeds City	„ 12	14,081	16,396	+ 2,315	15	251,641	+ 67,278
Leicester Corporation ..	„ 12	4,632	5,944	+ 1,312	..	..	..
Leyton U.D Council ..	„ 10	2,478	3,134	+ 656	15	47,299	+ 15,187
Liverpool Corporation ..	„ 12	15,801	23,985	+ 8,184	26½	599,836	+ 116,854
London County Council ..	July 16	63,958	80,714	+ 16,756	15½	1,242,465	+ 291,958
Maidstone Corporation ..	„ 10	279	432	+ 153	14½	5,631	+ 1,475
Manchester Corporation	„ 5	24,236	30,265	+ 6,029	14	426,269	+ 78,831
Newcastle-on-Tyne Cor.	„ 12	8,959	9,175	+ 216	15	143,165	+ 10,176
Northampton Cor. ..	„ 4	842	1,224	+ 382	14	17,855	+ 5,650
Nottingham Corporation	„ 10	5,924	7,319	+ 1,395	15	104,304	+ 19,389
Oldham Corporation ..	„ 13	3,336	4,503	+ 1,167	16	70,286	+ 15,201
Reading Corporation ..	„ 10	1,367	1,628	+ 251	14½	23,133	+ 4,197
Rotherham Corporation	„ 9	2,345	2,150	— 196	14½	32,647	+ 1,822
Sheffield Corporation ..	„ 13	12,605	16,650	+ 3,945	15½	266,855	+ 55,488
Southampton Cor. ..	„ 9	2,739	2,795	+ 56	14½	38,600	+ 3,126
Southend-on-Sea Cor. ..	„ 2	1,334	2,454	+ 1,120	14	27,412	+ 14,028
South Shields Cor. ..	June 14	1,129	1,467	+ 337	11	15,057	+ 3,121
Sunderland Corporation..	July 12	2,049	2,790	+ 741	15	43,492	+ 12,259
Torquay Tramways ..	„ 3	1,045	1,194	+ 149	26	24,544	+ 3,910
Tyneside Trys. & Trmrds	June 25	1,372	1,876	+ 504	26	25,415	+ 532
Wallasey Corporation	July 12	2,014	2,745	+ 731	14½	38,060	+ 10,712
Walsall Corporation ..	„ 5	1,181	1,314	+ 133	14	19,568	+ 2,674
Walthamstow U.D. Coun.	„ 12	1,521	1,682	+ 161	15	26,794	+ 4,956
Warrington Corporation	June 26	726	851	+ 125	12	11,158	+ 1,962
West Ham Corporation	July 10	4,725	5,299	+ 573	14½	80,794	+ 15,265
Wolverhampton ..	„ 9	1,637	2,012	+ 375	14	29,040	+ 4,365

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	July 18	£55,714	£59,213	27	£1,451,762	— £7,237
Ballarat and Bendigo(4 wks)	Apr. 27	4,095	4,201	4	4,291	+ 196
Brazilian Traction (Mrs.)	Apr.	8,330,000	9,208,000	17	35,032,000	+ 3,456,000
Brisbane	Apr.	35,530	32,775	17	151,110	+ 13,541
British Columbia .. $	May	486,876	628,847	47	6,650,954	+ 1,153,390
Buenos Aires Lacroze ..	June	38,375	61,356	52	512,859	+ 75,101
Burmah Tram. & Light Rs.	June 30	31,158	41,518	48	406,403	+ 106,471
Calcutta .. .. Rs.	July 5	78,634	90,803	26½	..	+ 310,443
Carthagena and Herrerias	June	5,047	3,373	26	16,791	— 10,841
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	June	1,754	2,323	48	22,002	+ 6,041
Hong Kong.. .. $	May 24	13,732	14,309	21	297,180	+ 16,236
Kalgoorlie	Feb.	2,378	2,278	8	4,840	— 55
La Plata	May	5,105	5,702	22	29,352	+ 4,274
Lima	Apr.	43,557	49,968	17	92,631	+ 10,652
Lisbon .. .. Escu	Mar.	238,299	276,635	..	..	..
Madras (2 weeks) Rs.	June 30	40,270	44,349	26	453,043	— 20,367
Manila .. .. $	May	175,500	183,050	21	1,046,433	+ 199,683
Montevideo	„	32,801	37,382	31	265,227	+ 28,945
Para	„	24,925	24,503	26	147,480	+ 3,339
Pernambuco	July 6	4,198	5,498	26½	145,838	+ 24,322
Peruvian .. .. $	Feb.	925,410	948,470	34	7,973,895	— 229,195
Rangoon	June	6,163	6,276	26	38,626	+ 927
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore .. .. $	June 7	14,126	15,145	23	354,916	+ 43,470
Toronto .. .. $	May	1,090,747	1,032,717	21	5,290,599	— 29,638
Winnipeg .. .. $	May	280,935	248,191	..	..	..

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THE
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SATURDAY, JULY 26, 1919.

INJUSTICE TO THE TROLLEY OMNIBUS.

MEMBERS of the Select Committee on London Traffic would not desire to make remarks that may be construed as unfair to a particular interest. Such a result, however, may be the outcome of observations by Mr. George Balfour (the only expert in electric traction on the Committee) and by Mr. Kennedy Jones, the chairman. During the examination of Mr. Watson, representing the London Tramway and Vehicle Workers' Union, the witness was asked by the chairman to explain his suggestion that the railless trolley car should have a fair trial, and his reply was that such vehicles had been successful in Germany. The witness might have added that the car had also justified itself in Austria and in this country. Mr. Balfour is reported to have asked the witness if he knew that the trolley omnibus "had been tried in Dundee, in Leeds and other places and had failed." Mr. Watson's reply was that he "did not know that," Mr. Balfour adding "Then you make take it from me that they have." Whereupon the chairman observed "And the London County Council tried such 'buses without success and abandoned them." Although it was not the business of the Committee to concern themselves with systems of traction, the statements made by Messrs. Balfour and Jones may have the injurious effect of restricting, unfairly, the resources of traffic undertakings. High prices having made tramway construction exceedingly costly, it is important that an alternative system which can be carried out at a reasonable expenditure should not suffer from unjust aspersion. The field of promise for the railless trolley vehicle became clearly marked before and during the war, and its practicability has induced engineering experts to undertake contracts for fitting up routes with the overhead cables and construction of the conveyances. No better justification for their enterprise can be desired than the experience of the Keighley Tramways department. After a thorough pre-war trial had been given to the petrol omnibus, its use had to be abandoned. On the other hand the railless trolley car has proved reliable and less expensive in working. So far from the trolley omnibus having resulted in failure at Leeds, Bradford, and Dundee, the facts are to the contrary. It is true that the Dundee railless trolley cars are no longer in operation, but that is due to the traffic having been inaugurated upon a road unsuitably surfaced, and to the Corporation having refused repeated requests from the Tramways Committee for proper repairs. We have the authority of Mr. Peter Fisher, manager of Dundee Corporation Tramways, for stating that the system was not discontinued owing to any defect in the vehicles or the equipment; the installation was highly efficient and the financial results quite satisfactory. With Mr. C. J. Spencer, formerly tramway manager at Bradford, now holding a Metropolitan appointment, it would have been easy to have requested his re-attendance and questioned him upon his experience. Then the Committee would have learnt that he inaugurated a service using a railless wagon for goods transport, both on and off tramway tracks, shortly before leaving Bradford. Other places where use is being made of the railless trolley system include Rotherham and Aberdare, while York is about to have an installation. As for London, there is no trace of a trial ever having been made. The railless car's great merit is that it induces traffic, and that when the volume justifies the laying of rails the overhead equipment is already in existence.

MUNICIPAL TRAMWAYS ASSOCIATION.

ANNUAL CONFERENCE.

The annual conference of the Municipal Tramways Association will be held at Dundee on September 17th, 18th, and 19th, the headquarters being at the Royal Hotel. The meeting will take place in the Town Hall. Mr. T. B. Goodyer, General Manager of Croydon Corporation Tramways, President for the year, will take the chair, and a large attendance is expected, as, owing to the war, the conferences of the last few years have been shorn of the usual adventitious attractions. In 1917 Mr. Peter Fisher, General Manager of Dundee Corporation Tramways, occupied the President's chair, but in view of the exigencies of the time, it was considered desirable that the conference should be limited to a strictly business programme and should meet in London. It was then arranged, however, that after the war the Association would hold an annual conference at Dundee, and the Council, with the approval of the President, has taken the first opportunity of fulfilling the promise then made to the representatives from Dundee. The Association having met frequently in London in recent years, it was felt that the members would prefer that this year's meeting should be held elsewhere.

THE INTERNATIONAL TRAMWAYS UNION.

ENLARGED BRITISH MEMBERSHIP DESIRABLE.

Mons. Henri Camp, Secretary of the Union Internationale de Tramways et de Chemins de Fer d'interet Local (23, Rue d'Arlon, Brussels), is at present in London, and attended the conference of the Tramways and Light Railways Association on Friday. He hopes to encourage a large number of British tramway undertakings to become members of the union, which has resumed its activities after the war. The union has been reconstituted, and the membership is now confined entirely to representatives of allied and neutral countries. At present the United Kingdom is represented in the membership only by the London County Council, the Manchester and the Leeds Corporation Tramways.

In view of the valuable work which the union has done for the tramway industry for more than a quarter of a century, it is to be hoped that many other municipal and company tramways will join and thus increase the British membership and influence. Hitherto the official proceedings of the union have been printed in German and French. In future the publication will be limited to the French edition, unless the English membership becomes sufficiently large to justify the considerable expenditure of printing the proceedings in English. The annual subscription is small, ranging from £2, in the case of those undertakings whose average receipts do not exceed £37,500, to £12 where the receipts exceed £187,500. Manufacturing firms and other companies, industrial associations, and persons interested in the tramway and light railway industry may also become associated or personal members, and the dues in these cases are almost nominal.

British Rails for Ipswich.—Ipswich Corporation propose to buy British steel rails. An American offer was made of £16 15s. per ton with shipment in August. Only one British firm tendered, and the price was 15 per cent higher than the American offer.

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L.C.C TRAMWAY MATTERS.

The London County Council met on Tuesday and received a number of tramway reports from the Highways Committee.

REPAIRS SUPERINTENDENT, GREENWICH STATION.—The names of three candidates for the appointment as repairs superintendent of Greenwich power station were submitted. This post was provided in the organisation scheme of the tramways department adopted some time ago. The three candidates selected by the Highways Committee were Mr. G. P. Henzell, Assistant Power House Engineer, Wimbledon power station, L. and S.W. Railway; Mr. H. Leigh, Mechanical Superintendent, North Metropolitan Electric Supply Company; and Mr. A. E. Scarborough, Assistant Resident Engineer, Park Royal generating station, Great Western Railway. On the recommendation of the Committee, Mr. G. P. Henzell was appointed. The salary is £300 a year, rising by annual increments of £20 to £400, together with a temporary war allowance of 20 per cent., plus £90.

WIRING SUPERINTENDENT.—For several years the position of wiring superintendent in the electrical branch of the tramways department has remained vacant owing to the sickness of the former superintendent, who subsequently resigned. The wages paid were formerly 60s. a week. The Highways Committee being of opinion that this rate of pay was not adequate, the Council agreed that the wages should be from 80s. to 90s. a week, exclusive of war wages (*i.e.*, 20 per cent., plus £90 a year).

EXTENSION OF TIME.—Powers obtained for the construction of certain tramways authorised by the London County Council Tramways and Improvements Acts, 1903, 1909, 1910, and 1913, will expire next year, and the Council decided to seek an extension of time under the Provisions of the Special Acts (Extension of Time Act), 1915.

EMBEZZLEMENT BY A CONDUCTOR.—The Committee reported that police court proceedings had been taken against a tramway conductor for attempting to embezzle the sum of 3d. received by him from three passengers on June 4. The magistrate, after hearing the evidence, said that he regarded it as a serious case, and sentenced the defendant to two months' hard labour.

STEAMBOAT SERVICE ON THE THAMES.—The Highways Committee presented a long report as to the desirability of the Council restarting a service of boats for passenger traffic on the Thames. They recalled that in 1904 the Thames River Steam Boat Service Act was passed, empowering the Council to run a service of vessels for the conveyance of passengers and parcels between Chiswick Eyot on the west and the eastern boundary of the parish of Plumstead on the east. Capital expenditure was incurred amounting to £301,080 for providing boats, coal hulks, and moorings (£216,080), and piers (£85,000). A service was run during three financial years, during which there was a total deficiency on working of £79,150. In view of the heavy loss, the Council, on the recommendation of the Highways Committee, abandoned the service and sold the steamers. The amount of debt for which the Council had no assets was £173,953, which has now been repaid. Including interest, the total cost to the ratepayers of the undertaking up to March 31, 1919, was £463,832. In view of these facts, and after careful investigation of the prospects, the Committee recommended the Council not to take any steps at the present time to establish a service of passenger steamboats on the Thames.

SCOTTISH TRANSPORT.

The report of the Rural Transport (Scotland) Committee, which has just been issued (C.M.D.227, 1s. 3d.), discusses the position at considerable length. It comprises, with appendices, fifty closely-printed pages, and is supplemented by three excellent maps in colour, showing the existing railways and principal roads in Scotland, and the new lines, the construction of which the Committee recommend. The object of the Committee was to ascertain the areas in Scotland which were most in need of transport facilities for the promotion of agriculture, forestry and other rural industries, and to point out the means of improving communication in such areas, in special reference to new or improved routes, light and narrow gauge railways, and motor transport. The Committee took the broad view that it is a national duty to provide every community with reasonably convenient means of communication, and they considered it would be to take too narrow a view to look merely for a direct pecuniary return on the capital expended. They pressed the importance of the indirect return—the increased production and better diffusion of wealth. As regards transport facilities, Scotland compares unfavourably with Norway and Sweden. In the latter country there are 16.2 miles of railway per ten thousand population, while in Scotland the comparative figure is 8.2. Among the measures of relief which the Committee recommend are the construction of light railways and the use of motor transport, which they suggest should be organised, and where necessary maintained, by the Scottish Department of the Ministry of Ways and Communications. It is only by such control, the Committee consider, that the full development of rural industry can be achieved. An essential element in the use of transport for such purposes will be the unification of control.

Extensions Proposed in Dundee.—The Tramways Committee of Dundee Town Council has resolved to apply for Parliamentary powers to construct tramway lines up Arklay Street and Clepington Road, with a view to linking up Maryfield and Strathmartine Road with Dens Road.

TRAMWAYS AND LIGHT RAILWAYS ASSOCIATION.

ANNUAL MEETING.

The annual meeting of the Tramways and Light Railways Association was held on Friday at Caxton Hall, Westminster, S.W., when the report and accounts for the year ended December 31, 1918, showing that the affairs of the Association were in a satisfactory condition, were adopted. The address of the Chairman, Sir Arthur Stanley, who was unavoidably absent, was read by the Secretary, and gave a summary of the work of the Association during the past year, which had been of an exceptionally important and arduous character. Seven members of the Council were elected to fill vacancies caused by rotation.

The eleventh annual congress followed the general meeting, when papers by Mr. W. L. Madgen, "Notes on Tramway Fares and Services," and by Mr. Harry England, "Post War Conditions and their effect upon Tramway Undertakings," were presented. The discussions which followed were of considerable interest.

There was a large attendance at the annual dinner and concert in the evening at the Connaught Rooms, Kingsway, W.C.

The papers read and a full report of the proceedings at the Congress will be given in a later issue.

EDINBURGH TRAMWAY AND OMNIBUS EXTENSIONS.

Edinburgh Tramway Committee have recommended the Town Council to authorise the Burgh Engineer, Mr. A. H. Campbell, to proceed with the necessary preparations for application for authority to construct the following tramway extensions:—

1. From the tramway terminus at Nether Liberton to a point near the cross roads on the main Liberton Road.
2. From the tramway terminus at Craiglockhart to Colinton.
3. From the existing tramways near King's Road, Portobello; to Seafield, partly in the Burgh of Leith.
4. From Pilrig Street to the entrance to Shrubhill Depot at Dryden Street.
5. Junction between Pilrig Street and Leith Walk.

The Town Council will also be advised to apply for authority to run motor omnibuses on any route within five miles of the city boundary, or alternately on the following routes:—

1. Craiglockhart tramway terminus, via Colinton, Juniper Green, and Currie, to Balerno.
2. Slateford Road tramway terminus, via Juniper Green and Currie, to Balerno.
3. Murrayfield tramway terminus to Corstorphine.
4. Blackhall (city boundary) to Davidson's Mains.
5. In connection with Dalkeith Road and Duddingston route, a small portion of roadway at Duddingston outside city boundary.
6. On any route where power has been obtained to operate electric tramways.

MISCELLANEOUS NEWS AND NOTES.

The Light Railway Commissioners have held an inquiry into the application for powers to construct a light railway from Southminster to Bradwell, a distance of 6¼ miles.

More New Cars for Liverpool.—It is proposed to purchase twenty new cars in addition to those recently ordered. The cars will be of the standard type described in our issue of June.

Liverpool Corporation Garage Foreman.—Liverpool Corporation Tramways Committee propose to appoint Mr. Clarence Birchall as motor garage foreman of the tramways department at a salary of £300 a year.

Hebburn Promised Omnibus Service.—In response to a deputation from Hebburn Urban Council, the Gateshead and District Tramways Company have promised to institute a motor omnibus service for the locality at an early date.

London Tramcar Overturned.—A fully laden tramcar left the rails in High Street, Brentford, late last Saturday night, causing injury to eighteen persons, including the driver and the conductor. The car could not be removed till Sunday morning.

Improved Road at Plymouth.—The Special Works Committee of Plymouth Town Council have decided to recommend that notice be given of their intention to prescribe a new line of frontage on either side of Pennycomequick, in accordance with a plan deposited with the borough engineer.

Costly Free Ride.—A Blackpool Corporation employee, by representing that he was a contract holder, avoided payment of his fare on a tramcar. In prosecuting the man at the police court, Blackpool Town Clerk asked for an exemplary fine, and the Bench imposed a fine of 20s.

Presentation to Union Official.—On the occasion of his retirement from office, Mr. W. Joyner, who has been ten years president of the Aberdeen branch of the Amalgamated Association of Tramway and Vehicle Workers, was presented with an easy chair and an umbrella for Mrs. Joyner.

New Motor Chassis for the Government.—Mr. Kellaway, in the House of Commons, stated that there are approximately 350 new motor chassis remaining to be delivered to the Ministry of Munitions at the manufacturers' option by the terms under which contracts are being liquidated.

Compensation for Injuries at Glasgow.—In settlement of an action at the Court of Session, Glasgow Corporation Tramways Department has paid £250 and expenses to a carter who was seriously injured by a tramcar dashing into the rear of his lorry as it crossed the lines.

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German Air Routes.—A determined attempt is being made in Germany to establish commercial air routes, and many services are reported to be in operation. Return tickets valid for a period of 30 days are issued, the fare from Berlin to Hamburg, for instance, being £22 10s. Passengers are allowed to have a certain amount of luggage.

Collision Costs Newcastle £74.—Owing, it was alleged, to the car driver sounding his gong too late and running at too high speed in a fog, a tramcar belonging to Newcastle Corporation crashed into a mineral-water lorry. At Newcastle County Court, judgment was given for the owners of the lorry for an agreed sum of £74, with costs.

Penny an Omnibus Mile.—Swansea Corporation have granted permission to Mr. J. H. Sears to run a motor 'bus service from the borough boundary to Forestlash, subject to the payment of a penny per bus mile, for a period of twelve months only, and subject also to any other permission or licence that is necessary being obtained.

Dundee Tramways Equipment.—The Tramways Committee of Dundee Town Council has agreed to recommend that a motor car should be purchased as an auxiliary to the repair wagon, and that the scheme of Mr. Richardson, electrical engineer, for the improvement of overhead equipment, including a shorter trolley arm and lighter head, should be brought before the Council's Electricity Committee for approval.

Motor Ambulance Collides with Tramcar.—Some weeks ago, a lady was driving an ambulance motor-car at a rapid pace through Colchester, and failed to slacken speed at a sharp junction of two streets across which the tram lines run. In consequence, she ran tilt into a tramcar, throwing it off the rails and injuring at least one passenger. Last week, the case came before Colchester Police Court, and the lady was ordered to pay a fine of £5.

Irish Transport Director.—The Dublin correspondent of *The Times* understands that when the Ways and Communications Bill becomes law an Irish branch will be established without delay, and that the position of director has already been offered to an Irishman who is thoroughly conversant with the problems of traffic control and development, and whose appointment is likely to have the unanimous approval of all parties in the country.

Platform Fare Collections Abolished at Bradford.—The Bradford Tramways Committee have decided to recommend the Council to discontinue the system of the collection of fares on the platform, owing to its unpopularity. In bad weather passengers have had to wait in the rain until the fares of passengers in front of them have been collected, and the tramway authorities have come to the conclusion that the present system is a waste of time at the intermediate stopping places.

L.C.C. Tramways Bill Postponed.—On Tuesday the Standing Orders Committee of the House of Lords declined to suspend the Standing Orders so that the London County Council Bill, in which power is sought to run omnibuses in connection with their housing scheme, might be proceeded with in the present session. Owing to the war, it was impracticable to prepare the Bill in time for it to be deposited before November 30th last, and it could not therefore be presented unless special consent was obtained.

Taxi-Cab Fares.—Lord Cave gave evidence before the Select Committee of London Traffic on Tuesday, and made a statement with reference to the evidence given by Lord Claud Hamilton on the question of taxi-cab fares. He said that if the reports were correct Lord Claud's evidence conveyed a thoroughly incorrect impression of what happened. There had been no delay or procrastination on the part of the Home Office officials. They took what they thought was the wisest course in the interest of drivers and owners, and especially for the protection of the public.

London Traffic Report.—A report of the Select Committee on London Traffic, which it is expected will be issued in a day or two, will probably recommend the establishment of a Traffic Board with executive power to co-ordinate and regulate traffic in the metropolitan area. It is rumoured that the recommendations will provide for a board of five members. Legislation will be necessary, and the London Traffic Board Bill will no doubt be presented to Parliament at an early date. It is suggested that Mr. Lynden Macassey, who was secretary of the Royal Commission of London Traffic, which issued its report in 1905, may be chairman.

Motor Omnibus Inauguration at Stirling.—Falkirk and District Tramways Company, under the energetic direction of Mr. D. Hays, the general manager, have been extending the area of their operations lately. Though the company's motor omnibuses have been plying for hire within the Stirling district for some months, Mr. Hays and his directors decided that the municipal authorities of Stirling should be invited to inaugurate formally the extended services. A tour of 112 miles was mapped out in the loveliest scenery of one of the most picturesque regions of the world, redolent of romance and stirring memories, and to this tour in the company's omnibuses the members of Stirling Town Council, the municipal officials of the town, and their wives and lady friends were invited. The invitation was largely accepted, and a numerous company took part in the proceedings. The route ran through Alloa, Dollar, and Milnathort, to Perth, thence to Crieff and Lochearnhead, returning home by Callander, Doune and Dunblane. Lunch was served at the Salutation Hotel, Glenfarg, and tea was taken at Lochearnhead. At both functions toasts were proposed and speeches made, everyone expressing good wishes and appreciation of the enterprise of the Falkirk and District Tramways Company in extending their area of operations to the historic districts of Stirlingshire and Perthshire.

Bad Language on Tramcars.—Mr. R. Newton, secretary of the Newcastle Branch of the Shipconstructors' and Shipwrights' Association, has written to the Newcastle local press complaining of the bad language which is permitted on the tramcars in the Tyneside city. The offenders are said to be workmen, and when workmen complain of workmen the evil must be fairly big in dimensions and grossly offensive in character.

A Popular Inspector.—It is sometimes assumed that an inspector has to choose between popularity with the men whose work he must supervise and the approval of his superiors. Mr. H. S. Banner, lately chief inspector of Southport Corporation Tramways, has shown that the assumption is erroneous. On the evening of Friday, July 4, Mr. T. J. Kendrew, general manager, presented Mr. Banner, on behalf of the tramway officials, with a suitably inscribed silver cigarette case, and on the Sunday following, motorman J. Orme, on behalf of the tramway employees, at the headquarters of the local branch of the Tramway and Vehicle Workers' Union, presented the ex-inspector with a handsome clock, as a token of the esteem in which he is held. In making the presentation, Mr. Orme said "Inspector Banner, while performing his duty to the manager and the Tramways Committee, has exercised a spirit of fairness, sympathy, and cordial co-operation."

Machinery breaks down in Southport.—Early last week the tramway system of Southport came to a sudden stop. Part of the machinery at the Electricity Works, Crowlands, had broken down, and by means of temporary repairs the service was partially resumed within a day or so. Mr. T. J. Kendrew, the general manager of the Tramways Department, quickly made arrangements to reduce inconvenience to passengers to a minimum. New time tables were drawn up, printed, and placarded on the cars and on the hoardings in the town, giving clear directions as to the modified services. As the breakdown was seen to involve considerable time in repair, arrangements were made at the end of the week by which the Southport and Birkdale electricity system was linked up, and a full supply of current given to the Southport electricity mains. On Peace Day, not only was the full service of tramways running, but the current supply necessary for carrying on the entertainments on the foreshore was forthcoming.

Future of Wolverhampton Tramways.—At the recent meeting of Wolverhampton Town Council, the annual report of the Tramways Department, showing a gross profit on the undertaking of £31,000, was received, and an allocation of £10,000 in aid of the borough rates was proposed by Alderman Craddock. He said that though the balance sheet gave a favourable account for the past year, the outlook for the next year was not so good, because the expenditure would be at least £15,000 more. Running costs had risen from 6.645d. per car mile in 1914 to an estimated cost of nearly 1s. 4d. for next year. Income was 11¼d. per car mile in the year before the war, and last year it amounted to 1s. 7d. It was impossible that the latter figure could be maintained, and the dropping of one passenger per car mile meant that the takings would go down by £4,600 on the year. Six new cars had been ordered; in normal times these cost between £650 and £700 each, and the new cars were to cost £2,000 each. Large expenditure on renewals and extensions would be necessary, and where possible single lines would be doubled. The report was adopted.

Taxation of Heavy Vehicles.—The suggestion has been made by the West Riding County Council that, having regard to the large increase in the number of heavy motor and steam-driven vehicles under five tons in weight, and the damage which they cause to roads, the owners of such vehicles should be liable to pay an annual licence fee. The subject has been considered by the County Councils Association, which has decided that the question of the taxation of heavy vehicles should be considered by the promised Joint Select Committee of both Houses of Parliament, and to suggest that this Committee should be set up at the earliest possible date.

Note the Constable on Point-Duty.—The importance of tramcar drivers paying attention to the signals of constables on point-duty was emphasised by Commissioner McCall at Swansea Assizes the other day. A firm of contractors sued Cardiff Corporation for £83 damages, caused by the collision of the plaintiffs' lorry with a tramcar belonging to the defendants. The evidence conclusively showed that the driver of the tramcar was to blame for the accident, and he said he neither saw the constable on point-duty nor heard a signal to stop. The Commissioner accepted the police officer's statement without qualification, and gave judgment for the amount claimed, with costs.

PERSONAL.

Mr. W. E. Lorkin has been awarded the Silver Medal of the Society of Arts for his paper on "Electric Welding and Its Application." An abridgement of this paper was published in our issue of April 10th, 1919.

Mr. Edgar Maxon, Deputy Electrical Engineer and Manager, Blackburn, has been appointed to be Borough Electrical Engineer of South Shields. There were over forty applications for the position.

Mr. Donald Sinclair, until recently resident engineer at Glasgow for the General Electric Company, has been appointed by the Chloride Electrical Storage Company, Ltd., as their representative for Scotland and the English Border Counties.

Mr. W. E. Ireland, acting rolling stock superintendent in the London County Council tramways department, has been authorised by the Council to take out a patent for his invention for the ventilation of electric tramway motors, it being understood that the Council shall be allowed to use the patent without payment if it so desires.

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FINANCIAL.

Hadfields, Ltd.—An interim dividend of 6d. per share, free of income tax, has been declared on the ordinary shares.

Stewarts and Lloyds, Ltd.—An interim dividend at the rate of 6 per cent. per annum on the preference shares, and of 10 per cent. per annum on the ordinary shares for the half-year ended June 30th last, is announced.

Liverpool Overhead Railway Co.—The directors have declared interim dividends for the half-year ending June 30 at the rate of 5 per cent. per annum on the preference shares, and 2½ per cent. per annum on the ordinary shares.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended July 23 amounted to £82,644, an increase of £14,720 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to July 23 (sixteen weeks and two days) the total receipts were £1,325,198, an increase of £306,767 on the corresponding period of 1918.

West Ham Tramway Losses.—The net revenue account of the West Ham Corporation Tramways for the year ended March 31, 1919, shows a deficit of £7,703. The reserve and renewals funds have been exhausted, and all future expenditure for renewals, which must be heavy, will be a charge upon the rates. The loss for the past year included sums paid as allowances to men on active service. The Borough Treasurer states that if it were not for these payments there would have been a profit on the undertaking of £7,739.

The Underground Group.—The following dividends have been announced:—

LONDON ELECTRIC RAILWAY.—On the 4 per cent. preference stock, 2 per cent., on the ordinary shares 1 per cent (being at the rate of 2 per cent. per annum, which is the same rate as 1918).

UNDERGROUND ELECTRIC RAILWAYS.—On the 6 per cent. income bonds 3 per cent., free of income tax.

CENTRAL LONDON RAILWAY.—On the undivided ordinary stock of 2 per cent. at the rate of 4 per cent. per annum (which is the same rate as 1918); on the preferred ordinary stock 2 per cent.

CITY AND SOUTH LONDON RAILWAY.—On the 5 per cent preference stock 2½ per cent., on the ordinary stock of 1 per cent. (being at the rate of 4 per cent. per annum, the same as for 1918).

LONDON GENERAL OMNIBUS COMPANY.—An interim dividend on the ordinary shares for the half-year ended June 30 last of 4 per cent., free of income tax.

CONTRACTS AND ORDERS.

Caernarvonshire County Council have empowered the County Surveyor to hire or purchase motor vehicles.

Fodens for Swansea.—The Swansea Corporation Highways Committee have ordered two five-ton tipping steam wagons, fitted with rubber tyres, from Messrs. Fodens, Ltd., at £1,260 each.

J. W. Courtenay, Ltd., Amberley House, Norfolk Street, London, W.C., have been appointed sole advertising contractors to Exeter Corporation Tramways.

Sandberg's "Insitu" Treatment of Rails.—Messrs. Scholey and Co., Ltd., 56, Victoria Street, London, S.W.1, the licensees and contractors for this patent process for increasing the durability of existing tramrails "in situ," inform us that they have obtained a repeat order for the treatment of the rails on two miles of single track for the Bournemouth Corporation Tramways. Up to the present time, contracts have been made with the following tramway undertakings, viz., Croydon, London (Metropolitan), Manchester, Birmingham, Bournemouth, Liverpool, Glasgow, Sheffield, Leeds, and repeat orders have been obtained from Croydon, London (Metropolitan), Manchester, Birmingham, and Bournemouth.

BUSINESS NOTICES.

Messrs. S. Smith & Sons (M.A.) Ltd., advise us that their branch managers from Australia, New Zealand, Italy, Siam and Scandinavia are at present in London considering post-war problems connected with their extensive business, and at the same time are negotiating with various firms throughout the country for sole representation of their goods abroad. Messrs. S. Smith & Sons are still open to undertake several additional sole agencies, and manufacturers interested should communicate with their Export Department at 179-185 Great Portland Street, London, W.1.

PUBLICATIONS WANTED.

"THE ELECTRIC RAILWAY JOURNAL" (NEW YORK).

Copies of the "Electric Railway Journal" (New York), SEPTEMBER 14 and 21 and OCTOBER 19, 1919, are required to complete files for binding. A liberal price will be paid.—Address, Box 61, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

"THE TRAMWAY AND RAILWAY WORLD."

Issues of January 1 and 13, 1916, and August 16 and October 18, 1917, to complete files for binding.

Indexes to Vols. XI (Jan. to June, 1902), XIII (Jan. to June, 1903), and XXXVIII (Jan. to June, 1915).

Reply to Box 24, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1918.	Incr. or Dec.
Aberdare U.D.C.	July 15	444	539	+ 95	15	8,121	+ 356
Aberdeen Corporation	„ 16	2,942	3,515	+ 573	6½	22,001	+ 4,254
Ayr Corporation	„ 19	1,801	1,111	— 690	9	6,972	+ 442
Belfast City	„ 4	7,619	10,323	+ 2,704	14	143,367	+ 37,465
Birkenhead Corporation	„ 20	2,285	3,014	+ 729	15½	43,200	+ 8,917
Birmingham Corporation	„ 12	23,721	25,927	+ 2,206	15	386,562	+ 42,108
do. Motor Buses	„ 12	1,567	1,804	+ 237	15	26,061	+ 3,502
Blackburn Corporation	„ 16	1,945	2,290	+ 345	16½	38,923	+ 9,667
Bradford Corporation	„ 19	9,310	11,207	+ 1,897	16	181,010	+ 41,900
Burnley Corporation	„ 19	2,309	2,116	— 193	..	..	..
Burton-on-Trent Co.	„ 20	437	599	+ 162	16	7,720	+ 1,368
Bury Corporation	„ 20	2,093	2,243	+ 150	15½	38,852	+ 6,316
Chatham & District	„ 10	1,378	1,756	+ 378	27	39,103	+ 4,906
Cork Electric	„ 10	692	766	+ 74	27	16,963	— 145
Derby Corporation	„ 19	1,569	1,684	+ 115	76	30,127	+ 6,328
Dundee City	„ 16	2,068	2,540	+ 472	8½	22,319	+ 5,098
East Ham Corporation	„ 19	1,523	1,960	+ 437	15½	30,419	+ 7,514
Glasgow Corporation	„ 19	23,784	30,924	+ 7,140	7	228,868	+ 26,381
Glossop (U.E. Sup. Co.)	„ 19	170	167	— 3	29	6,426	+ 1,170
Halifax Corporation	„ 15	2,553	3,513	+ 960	15½	55,134	+ 13,591
do. Motor Buses	„ 15	60	81	+ 21	15½	1,249	+ 325
Huddersfield Corporation	„ 19	3,549	4,984	+ 1,435	16	78,261	+ 19,710
Ilford U.D. Council	„ 19	952	1,191	+ 239	15½	12,779	+ 4,147
Ipswich Corporation	„ 19	785	1,109	+ 324	16	14,466	+ 2,787
Isle of Thanet	„ 16	366	1,719	+ 1,353	41½	25,353	+ 16,417
Kilmarnock Corporation	„ 19	297	308	+ 11	9½	2,722	+ 424
Lanarkshire	„ 10	3,619	4,186	+ 567	27	92,679	— 2,824
Leeds City	„ 19	14,105	16,318	+ 2,213	16	267,960	+ 69,447
Leicester Corporation	„ 19	4,542	4,885	+ 343	..	..	..
Leyton U.D Council	„ 17	2,300	3,180	+ 880	16	50,479	+ 16,067
Liverpool Corporation	„ 19	18,401	24,130	+ 5,729	28½	622,769	+ 122,586
London County Council	„ 23	67,924	82,644	+ 14,720	16½	1,325,198	+ 306,767
Maidstone Corporation	„ 17	269	376	+ 107	15½	6,007	+ 1,582
Manchester Corporation	„ 19	25,619	30,340	+ 4,721	16	487,560	+ 90,398
Newcastle-on-Tyne Cor.	„ 19	9,280	10,392	+ 1,112	16	158,557	+ 11,223
Northampton Cor.	„ 11	820	1,260	+ 440	15	19,016	+ 6,090
Nottingham Corporation	„ 17	5,566	7,057	+ 1,091	16	111,361	+ 20,480
Oldham Corporation	„ 20	3,559	4,202	+ 643	17	74,488	+ 15,844
Reading Corporation	„ 19	1,341	1,639	+ 298	15½	24,672	+ 4,794
Rotherham Corporation	„ 23	2,439	2,000	— 439	16½	36,769	+ 1,166
Sheffield Corporation	„ 20	13,377	15,880	+ 2,503	16½	282,736	+ 57,991
Southampton Cor.	„ 16	2,544	2,722	+ 178	15½	42,322	+ 3,304
Southend-on-Sea Cor.	„ 2	1,334	2,454	+ 1,120	14	27,412	+ 14,022
South Shields Cor.	June 14	1,129	1,467	+ 337	11	15,057	+ 3,121
Sunderland Corporation	July 20	2,167	2,514	+ 347	16	46,007	+ 12,606
Torquay Tramways	„ 10	1,043	1,404	+ 361	27	25,948	+ 4,271
Tyneside Trys. & Trmrds.	June 25	1,372	1,876	+ 504	26	25,415	+ 532
Wallasey Corporation	July 19	2,000	2,775	+ 775	15½	40,835	+ 11,486
Walsall Corporation	„ 19	1,150	1,339	+ 189	16	22,275	+ 3,036
Walthamstow U.D. Coun.	„ 23	1,717	1,635	— 82	16	32,727	+ 4,704
Warrington Corporation	„ 17	781	815	+ 34	15	15,784	+ 2,400
West Ham Corporation	„ 17	4,632	5,223	+ 591	15½	86,017	+ 15,857
Wolverhampton	„ 16	1,630	2 050	+ 420	15	31,091	+ 4,785

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Wks.	Aggregate. 1918-19	Increase or Dec.
Anglo-Argentine	July15	£54 657	£56,827	28	£1,536,609	— £5,067
Ballarat and Bendigo(4 wks)	May 25	3,256	3,256	8	7,557	+ 176
Brazilian Traction (Mlrs.)	May	9,030,000	9,062,000	21	44,594,000	+ 3,988,000
Brisbane	Apr.	35,530	32,775	17	751,110	+ 13,541
British Columbia $	May	486,876	628,847	47	6,650,954	+ 1,158,390
Buenos Aires Lacroze	June	32,375	61,356	52	542,859	+ 75,101
Burmah Tram. & Light Rs.	June 30	31,158	41,518	48	406,408	+ 106,471
Calcutta Rs.	July 19	72,412	85,726	28½	..	+ 334,798
Carthagena and Herrerias	June	5,047	3,373	26	16,791	— 10,841
Cordoba	Feb.	12,972	13,549	48	159,208	+ 11,492
East India	June	1,754	2,323	48	22,002	+ 6,041
Hong Kong $	„ 7	12,604	16,931	23	327,622	+ 20,892
Kalgoorlie	March	2,700	2,653	13	7,493	— 1,02
La Plata	May	5,105	5,702	22	29,352	+ 4,274
Lima	Apr.	43,557	49,968	17	92,631	+ 10,652
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	June 30	40,270	44,349	26	453,043	— 20,367
Manila $	May	175,500	183,050	21	1,046,433	+ 199,683
Montevideo	„	32,301	37,382	31	265,287	+ 26,943
Para	„	24,925	24,503	26	147,430	+ 3,339
Pernambuco	July 20	4,452	5,414	28½	156,594	+ 26,390
Peruvian $	Feb.	925,410	943,470	34	7,973,835	— 229,195
Rangoon	June	6,163	6,276	26	38,626	+ 927
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore $	June 7	14,126	15,145	23	354,916	+ 43,470
Toronto $	May	1,090,747	1,032,717	21	5,290,599	— 29,688
Winnipeg $	May	280,935	248,191	..	..	..

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(DICK, KERR SYSTEM.)

THE ENGLISH ELECTRIC COMPANY LIMITED,

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THE
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SATURDAY, AUGUST 2, 1919.

THE LONDON TRAFFIC REPORT.

COMPARED with the systematic, judicial and conclusive Report on London Traffic issued by a Royal Commission in 1905, the Report of the Select Committee on Traffic (Metropolitan Area) must be regarded as an emergency effort. The latter has been compiled chiefly for the satisfaction of a popular outcry for the remedy of a grievance, while the former was drawn up for the guidance of the legislator and the traffic expert. Appointed to allay the rising tide of resentment among the inhabitants of the metropolitan area at inadequate and increasingly costly travel facilities, the Select Committee have applied themselves with praiseworthy energy to the investigation of "the congestion in the existing means of transport in the metropolitan area, together with the question of fares," and have issued their report with notable celerity. In another column the main features of the Report are summarised, and it will be seen that the Select Committee urge the immediate establishment of a Traffic Board for the metropolitan area, and that it shall be invested with powers of initiation, direction, and control over the whole of London traffic routes and facilities. It will be remembered that the report of 1905 advised the institution of a special Traffic Board for London, but the proposal was highly unpopular. London County Council demanded full control of traffic facilities, but neither Parliament nor the London boroughs would consent to such an arrangement, and therefore the whole matter was shelved. If the Select Committee have won general consent to the idea of a London Traffic Board, they will indeed have performed valuable service. The Report of the Committee certainly lacks nothing in popular appeal, and the public to whom it has been addressed will no doubt be grateful for repetitions that aid the memory, and accept elaborated definitions and emphatic statements as evidence that something big is going to be done. After all, though traffic operation and organisation of traffic facilities are the work of the expert, London transport is the business of the citizens, and it is something when they are persuaded to consent willingly to the establishment of an authority having control over the whole of the metropolitan traffic. To adapt the poet's phrase, "the Traffic Board's the thing," and that, if the Select Committee's recommendation is accepted, has been secured. A suitable scheme for the composition of the Board and everything else necessary will follow in due course. One example of the characteristics of the Report which provoke criticism may be given. With regard to the Underground Railways, the Committee "wish, in all fairness, to eulogise, so that criticisms cannot be resented." And after an introduction so portentous, the criticism is that "'straphanging' is now regarded, not as a temporary misfortune of travelling, but as a natural commonplace, and from this to the recognition of overcrowding as a permanent feature of passenger transport is but an easy step." The menace which that terrible octopus familiarly known as the "Combine" holds over the heads of a doomed community is that they may possibly regard, at some unknown and distant period, "overcrowding as a permanent feature of passenger traffic."

PEACE DAY ON THE TRAMWAYS.

Notwithstanding that strong efforts were made to secure uniformity and unanimity in the observance of Peace Day among tramway workers, the variations throughout the country were numerous, some undertakings deciding to give the tramwaymen a complete holiday, others instituting a modified service, and the tramway employees of some undertakings striking rather than carry on operations on that day. The employees of Leeds Corporation Tramways, Potteries Electric Traction Company, Worcester Electric Traction Company, Chesterfield Corporation Tramways, Burnley Corporation Tramways, and Falkirk and District Tramways Company, refused to work. Lincoln Corporation, Exeter City Council, and Plymouth Corporation decided not to run the services. Newcastle Tramway Department workers decided by a majority in a ballot vote to carry out the agreement and work on Peace Day. Most other towns and large cities enjoyed the service of the tramways, London County Council and London Metropolitan tramways running till long after midnight.

It will be remembered that representatives of the tramway authorities and the National Transport Workers' Federation had agreed to the following arrangement :—

(1) That all employees who are called upon to work on Peace Day, July 19, shall receive double pay for that day, and they shall receive an additional day's holiday with pay afterwards, and wherever possible it shall be added to the annual holiday.

(2) That all employees who are not called out to work on Peace Day shall receive a day's pay for that day.

GLASGOW PEACE DAY CELEBRATIONS.

Monday, August 4, is to be held as Peace Day in Glasgow. The Municipal Employees' Section of the National Amalgamated Workers' Union called a meeting of its members last week, at which it was decided to take a ballot vote for and against a stoppage of work on Peace day. The ballot showed a majority in favour of stopping work. Should a general stoppage take place, Monday next will be the first week day on which tramcars have been wholly withdrawn from Glasgow streets since the original tramway company was formed in 1872.

MORE STEEL RAILS FROM U.S.A.

The London United Tramways, Ltd., are relaying about seven miles of double track on the Hammersmith to Brentford and Acton to Hanwell routes, with 2,500 tons of rails supplied by the United States Steel Products, Ltd., at a price, including delivery, of approximately £40,000. Five hundred tons have been received and about three-quarters of a mile of track at Chiswick has been relaid with the new rails.

Mr. C. J. Spencer, general manager of the London United Tramways, Ltd., has explained to a *Daily Mail* representative that although six British firms were asked to tender for the required rails, only one was in a position to do so. The one tender received was not greatly in excess of the American firm's tender, but it had clauses which would have enabled the contractors to raise the amount of the tender in the event of the cost of labour increasing. In view of labour conditions they were also unable to promise delivery on a definite date. The Americans were able to offer a superior quality of steel and a firm contract.

Birmingham and Glasgow Corporations recently placed orders for rails with the United States Steel Products Co., Ltd., for early delivery.

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LONDON TRAFFIC ENQUIRY REPORT.

The Select Committee appointed at the end of March to investigate the congestion in the existing means of transport in the Metropolitan area, together with the questions raised as to the increased fares, have issued their report (Parl. 147). At the outset, the Report states that the evidence taken all pointed to the conclusion that the adequate explanation of the demoralisation of traffic conditions in Greater London is the absence of a supreme traffic authority, possessing executive powers to control, co-ordinate and initiate traffic facilities.

Proceeding on the assumption that a Supreme Traffic Authority will be created at once, the Committee discuss its composition, powers, and functions. Owing to the multiplicity of public and other bodies involved, which might claim representation on an elected Board, the principle of direct representation is considered inapplicable. They therefore recommend the establishment of a Greater London Traffic Authority on the following lines :—

1. Small in numbers for efficiency's sake : Five members as a maximum, to be appointed by the Government from nominations submitted by :—Home Office—one ; Ministry of Ways and Communications—one ; L.C.C.—one ; local authorities outside the Administrative County of London—one ; with an independent chairman to be appointed by the Government.

2. The chairman should regularly report the proceedings of the Authority to the Secretary of State for Home Affairs, who shall answer for, and be responsible for keeping the House of Commons informed as to the work of the Traffic Authority.

3. The Authority, as far as Greater London is concerned, should have transferred to it the powers at present exercised by any Ministry or Department in so far as these powers are necessary to efficient administration by the Authority.

4. The Authority should exercise its powers over the Metropolitan Police area.

5. The Authority should in particular deal with the following :—

i. Prepare and keep up to date a general plan to which all London transit facilities should conform, and bring before the authorities concerned the necessary steps to be taken to secure improvements.
ii. Report to Parliament on the compliance with such plan of every new scheme promoted.
iii. Direct the co-ordination of the routes and services of existing means of transport—*e.g.* tubes, suburban railway services, tramways and omnibuses.
iv. Administer the Hackney Carriage Acts.
v. Approve all designs for any vehicles used for the transport of passengers, and any alterations thereto, and enforce regulations for the public comfort and convenieuce,
vi. Initiate legislation for traffic improvement.
vii. Make by-laws for the regulation of all traffic.
viii. Initiate and enforce remedial action in respect of all obstructions to street locomotion. Examples :—(*a*) Breaking up of streets ; (*b*) Selection of routes for all vehicles ; (*c*) Control of speed of different vehicles ; (*d*) All other obstructions to street traffic ; (*e*) The provision of subways at congested points if deemed necessary.

To sanction.—(*a*) Stopping places for tramcars, omnibuses, cab ranks, etc. ; (*b*) Omnibus and tramway queues ; (*c*) Entrances, exits, and platform accommodation on tube railways ; (*d*) All other remedies for abuses arising out of street traffic.

With the view of elucidating still further the functions to be assigned the proposed Traffic Board, the Report of the Select Committee states that, as the police, except in the City, do not possess adequate powers to regulate traffic, all vehicular traffic would greatly benefit by the existence of a Supreme Traffic Authority with adequate powers of regulation and control. Thus, the evidence has shown the need for :—

(1) Regulation of routes both of passenger and goods traffic, which would entail the use of side streets' whenever possible for slow-moving vehices.

(2) Restriction of up and down traffic in narrow streets, as in the City, by the selection of separate routes.

(3) Better control of all cross traffic, and of both slow and fast traffic.

(4) Systematisation of road repair, much of which especially in the main streets, should be carried out at night, or at such times as would best meet traffic conditions.

(5) Regulations for the breaking-up of the streets for the laying of gas and water mains, sewers, electric light cables, telegraph, and telephone wires, etc.

(6) Arrangement for stopping places for omnibuses, as well as for trams.

(7) Formation of queues at all heavy traffic points.

(8) Restriction of competitive services along the same routes.

(9) Regulation of all street obstructions, permanent, periodical (see 4), and movable.

(10) An increase of the speed limit for trams as well as omnibuses.

(11) The linking-up, so far as practicable, of tramway dead-ends —e.g., Farringdon Street and Blackfriars, Vauxhall Bridge Road and Harrow Road.

(12) The granting of powers to any municipal authority to own and operate omnibuses in their area.

In regard to fares, the "Committee have come to the conclusion that, while some increases of fares were inevitable, these are now, in some cases, far too high, while the general financial policy which renders them necessary is open to question. . . . The first duty of a supreme traffic authority would be not solely to see whether the sum of money raised by the increase of fares was adequate for the purpose of meeting legitimate liabilities or claims, but whether it was properly raised, whether, having regard to all the machinery of the undertaking, it was rightly, justly, and necessarily raised."

Upon the municipal aspects of the subject, the Committee "consider that there should be equal financial treatment of all surface means of locomotion which exist by an appeal to passenger traffic. They regard the rating of the trams, and their contributions towards the maintenance of the surface of the roads, as compared with the immunity of the omnibuses from both these charges, as indefensible, and there are, in their opinion, no counterbalancing considerations of sufficient magnitude to induce them to modify this view. At the same time, they do not propound any specific means of dealing with this problem, which would be one of the duties entrusted to the suggested traffic authority for recommendation to Parliament."

THE UNDERGROUND GROUP'S REPLY.

The following statement has been issued on behalf of the Underground Group of Companies :—

"The Report makes many allegations, but all of a general character, and advances no specific evidence in support of them. It is therefore quite impossible to furnish a specific answer. It will, we think, be seen, when the evidence taken by the Committee is published, that many of the allegations cannot be supported by the facts given. They would rather appear to rest upon the opinions and impressions of certain members of the Committee. Until the proceedings of the Committee are published, it is impossible to see how far the members were unanimous in their Report. It would therefore seem desirable to defer final judgment until all the necessary information is available.

On the question of fares the Report itself supplies the answer to the allegations that the Underground Group of Companies has made unreasonable increases. The average dividend on the capital employed is stated on page 7 of the Report to be 2.93 per cent., and on page 11 it is accepted that "actual capital is entitled to a reasonable return on its outlay." Surely less than 3 per cent. is not a reasonable return. No other decision would seem to be possible, having regard to the fact that a distinguished accountant, Sir Arthur Whinney, nominated by the Home Office, had, after a complete investigation of the books of the L.G.O. Company, stated : "The conclusion is therefore arrived at that up to the end of the year 1918 the increase in fares charged to the travelling public by the Company is fully justified by the increased working costs."

The primary recommendation of a Central Controlling authority for London traffic is a right and proper thing, and has always been supported by the Underground Group of Companies. The exact form of that controlling authority as recommended by the Committee is open to manifest objection. In particular, the L.C.C. as the body responsible for the actual conduct of the tramway system in London proper, is hardly entitled to sit in judgment upon traffic questions. While it is admitted that the proposed Ministry of Ways and Communications is, as regards London traffic, in a position that is exceedingly mixed, as it is now becoming an accomplished fact, it would seem desirable to devote some attention to clearing up that position as the easiest solution. The Underground Group of Companies has, however, no definite scheme of its own for a Traffic Board, and would accept any independent and impartial tribunal.

L.C.C. TRAMWAY MATTERS.

The Council met for the last time before the summer recess on Tuesday, when several important reports were received from the Highways Committee.

SUGGESTED REMOVAL OF CERTAIN FINANCIAL BURDENS.—In a long report comprising 10 closely printed pages the Highways Committee dealt with the financial burdens which the tramways have to bear, such as charges for street improvements along tramway routes, rating of tramway tracks, maintenance of roadways, and war service allowances. Generally speaking the aim of the Committee was to institute a reasonable comparison taking all relevant factors into account between the position of the Council's tramways and that of other tramway systems, and also of competing traffic undertakings. The veto of road authorities under Standing Orders of Parliament on the construction of new lines is also touched upon. As a result of their consideration the Committee recommended that application should be made to Parliament in the Session of 1920 for the Council to be relieved of the liability for the maintenance of the roadways in thoroughfares in which there are tramways, and that no part of the cost of street improvements be charged to the tramways account except the cost of improvements which are solely and specifically required for the working of the tramway system. Mr. G. H. Hume moved that the report be referred back, and after debate his motion was carried by 56 votes to 45.

CABLES AND DUCTS.—A supply of cables is required for the construction of tramways in East Hill and High Street, Wandsworth, and from Lee Green to Eltham. A capital estimate of £18,500 for the purpose was approved by the Council on July 28, 1914, but no expenditure has been incurred against this estimate recently, and

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in view of the altered conditions the Highways Committee recommended that the Council should approve of a new capital estimate for the work now to be put in hand, cancelling the balance unexpended on the old estimate. The cost of the present work is estimated at £23,830, and the Council approved the estimate and agreed that tenders for the work should be invited by public advertisement. An estimate for the laying of ducts for these tramways was also approved in July, 1914, and on the Highway Committee's recommendation the balance of the estimate remaining unexpended was recalled, and a new estimate of £6,530 was agreed to. Tenders for the work will be invited by public advertisement.

MISCELLANEOUS NEWS AND NOTES.

Higher Fares at Carlisle.—Last week, the Carlisle Electric Tramways Company put in force their announced intention of raising passenger fares all over by 50 per cent.

Doubling of Track at Leicester.—The Tramways and Electricity Committee of Leicester Town Council have decided to convert the present single track on an important section of the system into a double track, at a total cost of £18,000.

Second-hand Cars in Demand.—Leeds Corporation has recently sold eight cars to the Yorkshire (West Riding) Electric Tramways Company. The price is about £900 per car. Six cars will also be sold to the Walthamstow Council's tramways.

Great Orme Tramway and Llandudno.—A special committee has been appointed by Llandudno Town Council to consider the purchase of the Great Orme tramway, and, to negotiate with the company.

Barrow Tramways to be Municipalised.—Barrow-in-Furness Town Council has resolved to take over the tramway undertaking from the British Electric Traction Company, which has run the service for a number of years.

New Tramcars for Doncaster.—Doncaster Town Council have decided to apply to the Board of Trade for power to borrow £26,000—intending to devote £21,000 of the amount to the purchase of 10 additional tramcars, and the remaining £5,000 in the erection of a new car shed.

Protection for Upper Deck Passengers.—The manager of Walthamstow Council Tramways has been notified by the Police Commissioner that in future open deck tramcars will not be licensed unless upper deck seats are provided with suitable waterproof knee aprons.

Proposed Light Railway at Coggeshall.—The Light Railway Commissioners held an inquiry into the proposal to construct a light railway from Braintree to Marks Tey, on July 23. After evidence had been led and counsel heard, the Commissioner decided to adjourn until the Ministry of Ways and Communications had been set up.

Government and London Transport.—Replying to questions as to the report of the Select Committee on Transport, Mr. Bonar Law said that this report was now being examined by the Government, and he was not yet in a position to make any statement in regard to it. The Government thoroughly realised the urgency of this problem.

Light Railway for Lochfyne.—At a meeting of Lochfyne fishermen, held at the Cross, Inveraray, a resolution was passed, embodying a petition to the Ministry of Ways and Communications, praying that the construction of a light railway to Lochfyne, which would facilitate the transit of fish, should be proceeded with as speedily as possible.

Returned Service Men Honoured.—The Peace Celebrations Committee of Yarmouth have entertained the eighty-eight tramwaymen employed by the Corporation who have been on service during the war. The function took the form of a dinner at the London Restaurant, the men being entertained in two sections, one on Thursday and the other on Friday last.

New Route at Halifax.—Some time ago, Halifax Town Council decided to extend their tramways from West Vale to the Vicarage at Stainland, and also proposed to run motor omnibuses from Stainland to Ripponden. Most of the preliminaries have now been got through, and this week the routes were inspected by the Halifax Tramways Committee, special attention being given to the parts of the road which it will be necessary to widen.

Track Repair at Brighton.—The Tramways Committee have reported to Brighton Town Council that they will require to spend on the improvement of the tramway tracks the sum of £10,000 per annum for the next seven years, in addition to the whole of the reserve and present renewals fund, which now stands at £22,533. Of the profit balance of £5,092 for the last financial year, £5,000 has been transferred to the credit of the borough fund.

Accident at Burnley Electricity Works.—Last Monday morning, about six o'clock, a main pipe in the boiler house of Burnley Electricity Works burst, letting out all the steam from the boilers. The plant had to be shut down, stopping the electric power supply, and holding up the tramway service. Temporary repairs were quickly effected, however, and the tramcars resumed running about nine o'clock.

Municipal Strike at Southampton.—The strike of Municipal employees at Southampton was settled on Tuesday and the men returned to work on Wednesday. The demand for an increase of 5s. was granted and several other concessions were made to various grades of workmen. The tramway service had been suspended for a day. The tramway men were not directly concerned in the dispute.

Gas Power for Motor Vehicles.—The report of the Inter Departmental Committee (Cmd. 203, price 1s.) on the use of gas as a source of power for motor vehicles, etc., which has just been issued, supplements the interim report of April, 1918. It deals in particular with gas under pressure, and gives some results of experience with flexible gas bags. Including appendices and a number of illustrations, the report occupies 40 pages.

A "Dangerous Trade."—According to the reports of numerous disturbances and assaults taking place on Burnley Corporation tramcars, it seems as though the occupation of tram-conducting in that town should be scheduled among the "dangerous trades." While a conductor was helping a woman on to the platform of his car, he was violently assaulted by the woman's husband. At the same sitting of Burnley Police Court, another man was prosecuted for creating a disturbance on a tramcar and pointing a revolver at a woman conductor.

Suggestions for London Traffic.—A deputation from various working-class organisations was received by the General Purposes Committee of London County Council last Monday. Mr. Morrison, the spokesman, pointed out that the Council should realise its duty to the travelling public and become the transport authority for London. He also suggested that the Council should run motor omnibuses in competition with the London General Omnibus Company, and the restarting of the steamboat service on the Thames.

Omnibus May Supersede Tramway.—Lancaster Town Council has not been able to make its tramways pay, and at the last meeting they were faced with another addition to the already large deficit. Mr. T. Wilkinson reported that the Tramway Committee were bound to undertake immediately the expenditure of £4,000 to put the electric track into proper order, and in view of a probable deficit equal to a rate of 6d. in the £, the whole question of substituting omnibuses for tramways should be considered. A special Committee was appointed to consider the question.

Discontent on Sheffield Tramways.—A curious difficulty has arisen in Sheffield Tramways Corporation Department, caused by the operation of the 48-hour week. Men employed on the Firth Park and Brightside sections are not required to work overtime, with the result that their wages never exceed the standard minimum of £3 3s. per week. Drivers on other sections regularly work overtime, and they earn from 20s. to 25s. per week more than the Brightside men. The latter complain, and have sent in a claim for 12s. advance per week to the general manager.

Special Tracks for Motors.—Reporting on the proposed improvements to be made on the roads and transport facilities in Aberdeenshire, the Rural Transport Committee recommend construction of light railways between Ballater and Braemar, and from Alford to Bellabeg, as well as a new road through Glen Feshie to Speyside. The most noteworthy recommendation of the Committee, however, is that concrete motor tracks should be made to Echt and Skene and to Newburgh, drivers of heavy motor vehicles being obliged, under penalties, to use those tracks.

Glasgow Employees' Wages.—An application has been made to Glasgow Corporation by the Municipal Employees Association on behalf of the tramway employees for payment at the rate of time and a half for Sunday work and for 54 hours' pay for 48 hours' work. The demand for 54 hours' pay has arisen out of the recent reduction of hours from 51 to 48 per week without loss of pay. The hours had been reduced from 54 to 51 before the war, but 54 hours were worked during the war and the 3 extra hours were paid for as extra work. The employees contend that they should now receive the same wages for 48 as they had for 54 hours during the war.

Bournemouth versus Poole.—For a considerable time, Bournemouth Corporation has been endeavouring to persuade the neighbouring Corporation of Poole to consent to the raising of the tramway fares upon that portion of the Bournemouth tramway system which runs through Poole. Finding persuasion unavailing, Bournemouth Town Council took the drastic step of issuing a notice to the tramway employees operating the Poole section, stating that, as the Poole local authority had refused to permit the raising of fares, they could not benefit by the National Agreement of March 20 arranged beween the representatives of tramway workers and municipal and tramway company owners of undertakings. Poole Corporation, however, has obtained an injunction from Justice Eve, restraining the Bournemouth Town Council from acting upon the notice.

Tramways Under the Transport Bill.—In the House of Lords on Thursday, Lord Islington moved an amendment to include in the undertakings under control of the Minister tramways belonging to local authorities. He said that he did so with the object of eliciting a statement from the Government as to why this most important link in the scheme of national transportation was omitted. The exclusion of such tramways would dig very deeply into the proposals for effective co-ordination, and would create a series of transport anomalies and partialities throughout the country. The Earl of Lytton said it was true that in the first draft of the Bill powers were asked to take possession of these tramways. He did not think the Government would have any objection if their lordships were once more to place them under their control. Owing to the strong opposition expressed by the owners of various municipal tramways, they consented to put in the words which the noble lord wanted to strike out. He could not hold out much hope, however, that the words, if struck out, would not be reinstated by the House of Commons. The amendment was by leave withdrawn.]

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Women Clerk Tramway Workers.—Salford Corporation Tramway employees are insisting that the continued employment of women clerks at the cash receiving offices is contrary to the agreement between the Tramways Committee and the Tram and Vehicle Workers' Association, that all the men who had returned from service would be reinstated. Mr. G. W. Holford, the general manager of the Tramway Department, says that the women receiving clerks were not mentioned in the agreement referred to by the men, and that it had been the intention before the war to utilise women in this department, as they were utilised in Manchester.

Ilford Strike Ended.—The question whether the men should be paid overtime or ordinary rates for the time worked over the 47-hour week, dating from the last pay-day in May, was the subject of acute dispute between Ilford Town Council and the municipal employees. At the end of last week, every employee of Ilford Town Council was out on strike, including tramwaymen, electrical power workers, road sweepers, dustmen, and even women school cleaners, with result that the whole town was in darkness and without tramway or any other public service. On Monday, July 28, the Council conceded all demands and the dispute was settled. The employees resumed work on Tuesday morning.

PERSONAL.

Mr. Archibald Page has been appointed general manager of the Clyde Valley Electrical Power Company.

Mr. Johnstone Wright has been selected for the position of chief assistant electrical engineer to Bradford Corporation. The salary is £750 per annum. There were 139 applicants.

Mr. Kennedy Jones was entertained at dinner on Thursday by the members of the Select Committee on London Traffic, in recognition of the manner in which he discharged his duties as chairman.

Sir Evan Jones, Bart., M.P., has resigned his position as chairman of the Road Transport Board. The main duties of the local organisation of the Board are now concerned with transport for foodstuffs, and it was therefore incorporated with the divisional organisa- of the Ministry of Food on July 31.

Major F. B. Hills, D.S.O., has been appointed engineer and manager of Guernsey Electric Light and Power Company. Major Hills previous to the war was engineer and manager of the North of Scotland Electric Light and Power Company. He was mobilised in 1914, and commanded the Montrose Company, N.S., R.G.A.

FINANCIAL.

Bristol Tramways and Carriage Company.—An interim dividend is announced for the half-year ended 30th June last at the rate of 3 per cent. (free of income tax) on the Ordinary Shares.

Ayr Corporation Tramway Receipts for the week ended July 26 broke all previous records. The number of passengers carried was 260,000 and the receipts amounted to £2,093. The record for a single day was also broken, the receipts being £385, or £70 more than the previous record.

Hong-Kong Tramway Company have declared an interim dividend on account of the year 1919 of 9d. per share, payable on 25th August, to holders registered 11th August. Warrants for dividend, less income-tax, will be posted to holders on the London register as soon after the 24th August as the necessary share register advices are received.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended July 30 amounted to £80,213, an increase of £10,639 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to July 30 (seventeen weeks and two days) the total receipts were £1,405,586, an increase of £317,581 on the corresponding period of 1918.

NEW CATALOGUES.

Chain Type Cable Hooks.—A leaflet on this subject issued by Siemens Brothers and Company, Ltd., illustrates the types of hooks manufactured by them for supporting cables on walls. Only a small number of standardised parts is required, and the hooks provide a convenient means of suspending any of the usual sizes of cables. For fixing the hooks, expanding bolts are supplied of simple design. The leaflet also contains particulars and prices of these.

Bennis Steam Suction Ash Conveyor.—Edward Bennis and Company, Ltd., have issued an illustrated account of their labour saving steam suction ash conveyor. With this apparatus ashes and clinker are taken away in a pipe line laid in the floor of the boiler house. The ashes are raked into the pipe through holes provided with hand valves and the steam valve being opened, the ashes are drawn into the intake of the conveyor and carried by means of suction to an overhead hopper, from which the ashes can be removed as desired. The pamphlet gives particulars of the equipment, in which there are no moving parts. It is not necessary to provide a receptacle to take the ashes, as these may be discharged if desired into a piece of waste land, or direct into a railway wagon or cart.

The Great Western Railway have placed an order with the Associated Equipment Company, Limited, for another 50 chassis. This is in addition to the 21 chassis ordered in February last.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1918	Incr. or Dec.	Aggregate. Wks.	1918.	Incr. or Dec.
Aberdare U.D.C. ..	July 22	456	479	+ 23	16	8,599	+ 478
Aberdeen Corporation ..	„ 23	2,871	4,096	+ 1,225	7½	26,097	+ 5,479
Ayr Corporation ..	„ 26	1,055	2,093	+ 1,038	10	9,066	+ 1,480
Belfast City	„ 18	7,330	9,924	+ 2,585	16	164,044	+ 42,211
Birkenhead Corporation	„ 27	2,285	3,049	+ 764	16½	46,250	+ 11,966
Birmingham Corporation	„ 19	23,334	24,435	+ 1,101	16	410,998	+ 43,210
do. Motor Buses	„ 19	1,478	1,707	+ 229	16	27,789	+ 3,782
Blackburn Corporation ..	„ 23	1,844	2,229	+ 385	17½	41,162	+ 9,979
Bradford Corporation ..	„ 26	9,694	11,357	+ 1,663	18	192,367	+ 43,563
Burnley Corporation ..	„ 26	2,270	2,961	+ 691	..	..	..
Burton-on-Trent Co.. ..	„ 27	436	504	+ 68	17	8,224	+ 1,436
Bury Corporation ..	„ 27	2,150	2,476	+ 326	16½	41,328	+ 6,641
Chatham & District ..	„ 17	1,347	1,717	+ 370	28	40,820	+ 5,277
Cork Electric	„ 17	628	763	+ 135	28	17,726	— 210
Derby Corporation ..	„ 26	1,552	2,010	+ 458	17	32,188	+ 6,786
Dundee City	„ 23	2,068	2,419	+ 831	9½	25,238	+ 5,930
East Ham Corporation ..	„ 26	1,577	1,887	+ 310	16½	32,306	+ 7,823
Glasgow Corporation ..	„ 26	25,961	25,805	— 156	8	254,673	+ 27,494
Glossop (U.E. Sup. Co.) ..	„ 26	179	202	+ 23	30	6,628	+ 1,193
Halifax Corporation ..	„ 15	2,553	3,513	+ 960	15½	55,134	+ 13,591
do. Motor Buses ..	„ 15	60	81	+ 21	15½	1,249	+ 325
Huddersfield Corporation	„ 26	3,729	4,712	+ 983	17	82,973	+ 21,693
Ilford U.D. Council ..	„ 26	1,034	825	— 209	16½	20,605	+ 3,950
Ipswich Corporation ..	„ 26	866	900	+ 34	17	15,360	+ 2,842
Isle of Thanet	„ 23	382	1,711	+ 1,329	42½	27,069	+ 17,746
Kilmarnock Corporation	„ 26	308	331	+ 23	10½	3,058	+ 448
Lanarkshire	„ 17	4,885	4,154	— 731	28	96,833	— 3,365
Leeds City	„ 26	14,126	16,424	+ 2,298	17	284,387	+ 71,756
Leicester Corporation ..	„ 26	4,678	6,202	+ 1,524	..	..	..
Leyton U.D Council ..	„ 24	2,468	3,096	+ 658	17	53,575	+ 16,725
Liverpool Corporation ..	„ 26	19,027	24,445	+ 5,418	29½	648,215	+ 128,006
London County Council ..	„ 30	69,574	80,213	+ 10,639	17½	1,405,586	+ 317,581
Maidstone Corporation ..	„ 24	271	356	+ 85	16½	6,363	+ 1,667
Manchester Corporation	„ 26	25,937	30,478	+ 4,541	17	518,038	+ 95,154
Newcastle-on-Tyne Cor.	„ 26	9,276	9,918	+ 642	17	163,498	+ 12,000
Northampton Cor. ..	„ 18	869	1,323	+ 454	16	20,339	+ 6,544
Nottingham Corporation	„ 24	6,224	7,307	+ 1,083	17	111,669	+ 21,563
Oldham Corporation ..	„ 27	3,649	4,582	+ 933	18	79,070	+ 16,777
Reading Corporation ..	„ 24	1,339	1,797	+ 458	16½	26,468	+ 5,252
Rotherham Corporation	„ 23	2,439	2,000	— 439	16½	36,769	+ 1,166
Sheffield Corporation ..	„ 27	13,479	17,112	+ 3,633	17½	299,848	+ 61,624
Southampton Cor. ..	„ 28	2,602	3,313	+ 711	16½	45,635	+ 4,014
Southend-on-Sea Cor. ..	„ 23	1,492	3,057	+ 1,565	17	38,749	+ 15,973
South Shields Cor. ..	„ 19	1,269	1,201	— 68	16	21,826	+ 3,815
Sunderland Corporation..	„ 27	2,211	3,107	+ 896	17	49,114	+ 13,502
Torquay Tramways ..	„ 17	948	2,931	+ 1,987	27	28,183	+ 2,355
Tyneside Trys. & Trmrds.	„ 30	944	1,876	+ 504	26	25,415	+ 532
Wallasey Corporation ..	„ 26	1,133	2,930	+ 797	16½	43,766	+ 12,284
Walsall Corporation ..	„ 26	1,237	1,320	+ 83	17	23,595	+ 3,119
Walthamstow U.D. Coun.	„ 26	1,472	1,606	+ 134	17	36,097	+ 5,398
Warrington Corporation	„ 24	745	691	— 54	16	14,475	+ 2,346
West Ham Corporation	„ 24	4,711	4,835	+ 124	16½	90,852	+ 15,981
Wolverhampton	„ 30	1,776	1,931	+ 155	17	34,658	+ 4,859

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	July 22	£56,279	£59,632	29	£1,598,241	— £1,714
Ballarat and Bendigo(4 wks)	May 25	3,266	3,266	8	7,557	+ 176
Brazilian Traction (Mlrs.)	May	9,080,000	9,562,000	21	44,594,000	+ 3,988,000
Brisbane	Apr.	35,530	32,775	17	151,110	+ 13,541
British Columbia .. $	May	486,676	628,847	47	6,650,954	+ 1,153,390
Buenos Aires Lacroze ..	June	38,375	61,356	52	542,859	+ 75,101
Burmah Tram. & Light Rs.	June 30	31,158	41,518	48	406,403	+ 166,471
Calcutta .. .. Rs.	July 26	77,883	88,727	29½	..	+ 345,697
Carthagena and Herrerias	June	5,047	3,373	26	16,791	— 10,841
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	June	1,754	2,323	48	22,002	+ 6,041
Hong Kong.. .. $	„ 7	12,604	16,931	23	327,622	+ 20,892
Kalgoorlie	March	2,700	2,653	13	7,493	— 1,02
La Plata	May	5,105	5,702	22	29,352	+ 4,274
Lima	„	42,949	42,966	22	110,666	+ 8,925
Lisbon .. .. Escu	Mar.	288,299	276,625	..	..	..
Madras (2 weeks) Rs.	June 30	40,270	44,349	26	453,043	— 30,367
Manila .. .. $	May	175,500	183,050	21	1,046,433	+ 199,683
Montevideo	„	32,301	37,382	31	265,287	+ 26,943
Para	June	25,445	24,647	30	172,077	+ 2,541
Pernambuco	July 20	4,452	5,414	28½	156,594	+ 26,390
Peruvian .. .. $	Feb.	925,410	948,470	34	7,973,835	— 229,195
Rangoon	June	6,163	6,276	26	38,626	+ 927
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore .. .. $	June 7	14,126	15,145	23	354,916	+ 43,470
Toronto .. .. $	May	1,090,747	1,032,717	21	5,290,599	— 29,688
Winnipeg .. .. $	May	280,935	248,191	..	..	..

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SATURDAY, AUGUST 9, 1919.

PROFITEERING TRAMWAY WORKERS.

The term "profiteering" is greatly in danger of being overworked, but that is no reason why it should not for once be employed in its legitimate function of denoting extortionate exploitation of the needs of the public. A profiteer is a seller of commodities who measures the price of his goods, not by their value but by the need for them. Tramway workers have a commodity to sell, viz., their labour, and it seems that they are determined that the price shall be limited only by the capacity of the tram-users to pay, and measured only by the degree of public necessity. Up till now, no attempt has been made to assess the real value of tramway labour. Value is a relative term, of course, and therefore difficult to fix in figures; but the most extreme of Labourists will admit that labour is comparable with labour. If, for example, it is found that the warehouseman or clerk must pay two hours of his labour-time for one hour of the tramwayman's labour-time, the question whether the bargain is just or not admits of decision. Complex as it may seem, the problem of what is a fair wage for tramway workers ultimately resolves itself into a simple comparison such as that suggested. The prices of food, boots, clothes, and other commodities may often depend upon world factors beyond common understanding or even Government control, but the tramway labour equation contains no such indeterminable factors. Motorman and typist, clergyman and conductor, all the members of the community and the whole of the tramway workers stand on the same level in regard to cost of food and other necessities. If there is to be any difference in the value of various forms of work, therefore, it must be found in the quality of the labour itself, its productiveness or its rarity. A skilled artisan, for example, is of more value than a labourer, first of all because he has to spend some time in acquiring his skill. To take a simple case. A well-trained bricklayer will build a wall more quickly, with fewer broken bricks, and make it last longer, than his hodman. That is to say, he contributes more to the wealth of the community, and is entitled to acknowledgment of the fact. Under present social conditions the hodman has no right to the wealth earned by the skilled bricklayer. He gets the amount of value he contributes to the general wealth, and is entitled to no more. Tramway labour is cheap labour in the strict sense of the word. No long training is needed for the work. Taking advantage of their power as a united body, tramway workers have raised the price of their labour above that of many skilled workers. That is to say, a skilled artisan has to pay an hour of his labour-time for, say, forty minutes of the labour-time of a man less skilled and performing less arduous work. Here is not a question of labour *versus* capital, but of labour against labour, the lower acting unjustly and oppressively towards the higher. Tramway authorities have a responsibility in this matter. A merchant is privileged to trade on the assumption that he will protect his patrons from extortion and false goods. The tramway authorities are the merchants who vend tramway labour to the community. If the public are paying an extortionate price for tramway labour, they are largely responsible, and have failed in their duty to their customers. This aspect of the matter has not been sufficiently regarded. If tramway committees and managers take heart of grace, and courageously set themselves to securing fair value in tramway labour to the community, they will meet with a surprising amount of support.

LIVERPOOL TRAMWAYS STRIKE.

Liverpool citizens received a disagreeable shock of surprise on the morning of Bank Holiday, August 4, when they found that the whole of the city tramways employees had ceased work because the Tramways Committee had refused to agree to satisfy their demands. The dispute has arisen out of the National Agreement of March 20. Previous to April 1, Liverpool tramwaymen had been working sixty hours per week, and on the terms of the agreement their hours were reduced to forty-eight per week, while their pay was fixed on the basis of fifty-seven hours per week. The disaffected men claim that their pay should continue at the rate of sixty hours per week.

The men belong to two different associations, the National Association of Tramway and Vehicle Workers and the Municipal Employees' Association, the members of the former association having loyally accepted the terms of the agreement. A meeting of the members of the latter association was held shortly after Sunday midnight, and it was then decided to cease work immediately. In the morning only the men who are members of the Tramway Workers' Union presented themselves for duty. As the majority of the drivers and conductors belong to the disaffected union, only a limited service was possible, and in view of the situation in the city, the Tramway Committee considered it prudent not to send out any of the cars.

On Monday afternoon the Tramways Committee issued a statement to the public explaining the causes for the stoppage of the tramway services, asserting that the tramwaymen had stopped work without warning, and recapitulating the terms of the National Agreement, which, they say, has been accepted by practically the whole of the tramway undertakings of the country. The manifesto continues: "The Liverpool employees, however, claim that they should be paid at the rate of sixty hours per week for forty-eight hours' work, and this is all the more extraordinary as the same union is at the present time only claiming fifty-four hours' pay for forty-eight hours' work from the Glasgow Corporation. It will, therefore, be seen that an attempt is being made to place Liverpool in an anomalous position by demanding a higher rate of pay for the tramway traffic employees connected with the above-mentioned union than that paid to the employees of any other tramway undertaking in the country."

In reply, the strikers' leaders deny that the Municipal Employees' Association was party to the agreement, repudiating it on the gound that while in some towns it gave an increased rate of pay, in others, including Liverpool, it meant a reduction of pay. In spite of this, the agreement was forced upon the Liverpool tramwaymen. They also deny that they struck without warning, as their local secretary (Mr. W. J. Daniels) conveyed their decision to the Tramways Committee on Friday morning. They consider that this was sufficient notice, especially as on June 15 they handed in strike notices, which were later suspended, but not withdrawn.

The strike was still in progress on Friday, causing immense public inconvenience and great loss to the tramways.

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FURTHER WAGE DEMANDS.

The Secretary of the National Transport Workers' Federation has written to the Honorary Secretary of the Municipal Tramways Association, stating that at a representative conference of various Unions catering for Tramway and Omnibus Employees he was directed to apply for a conference between his organisation and the Municipal Tramways Association, in order to discuss the following :

1. An increase of 12s. in the guaranteed weekly wage for all employees of 18 years and over engaged in tramway and omnibus undertakings or companies in this country.

2. An advance of 6s. for all employees of under 18 years of age, in the above-named undertakings or companies.

3. A proposal that the qualifying period minimum to maximum rates of pay for all employees aged 18 years and over should not exceed six calendar months.

4. The merging of all war increases into permanent wages.

Representatives of the employees are meeting representatives of the Federation to consider the position. This was discussed in our issue of July 5 in view of these demands, which were then pending.

PERNAMBUCO TRAMWAYS AND POWER COMPANY.

The seventh ordinary general meeting of the Pernambuco Tramways and Power Company, Ltd., on August 7, was held at the offices of the company, River Plate House, E.C., Mr. Follett Holt, M.Inst.C.E. (the Chairman of the company), presiding. The Secretary (Mr. H. Tattam) read the notice convening the meeting, and the report of the auditors.

The Chairman, in moving the adoption of the report and accounts, said that the year 1918 proved to be a very difficult period. During the last year of the war, as they knew, the shipping situation grew acute, and prices for fuel and all materials became exorbitant, and the difficulty of obtaining them at any price was intense. It was satisfactory to report, however, that throughout that troublesome period they were able to keep the whole of their service going and did not close down in any department for a single day. The gross revenue of the company continued to expand, and it was interesting to note that it had almost doubled during the last four years. Unfortunately, the high prices of fuel and stores swallowed up the gross increase last year. Their total net receipts were about the same as in the previous year, and after transferring £10,229 to the capital reserve account, £10,000 to renewal and reserve account, and £1,500 to amortisation account, the directors were able to recommend a dividend of 3½ per cent. on the Preference shares. They were not very satisfied with this result, and he hoped that they would never again have to combat such difficulties as they met with during the last four years. They had still to face the aftermath of war, with its labour troubles and high prices, but the directors were confident that the company would prove to be a successful concern when they got back to anything like normal times.

To complete their system they would require more capital, and after consulting with their French and English financial friends they had decided as a first step to ask the shareholders to-day to give them powers to raise money on security ranking after that of the company's debentures. When the shareholders had given these powers the Board would endeavour to obtain the sanction of the Treasury to an issue of capital to be made to the present share and debenture holders. As a Board they considered that the development of their lighting system and other works urgently called for under their concessions would fully justify the employment of the additional capital they proposed to raise. Their gross revenue from the whole of the undertaking for the current year showed a substantial further increase, but expenses were still on the high side, and this year might not show any marked improvement in the net results. But the quick development of their lighting and tram business which would be brought about when they had the capital necessary to deal with it would help them to produce in the near future better results.

Mr. Herbert K. Heyland seconded the motion.

Mr. H. W. Henderson said that he had recently returned from a visit to Pernambuco, and he was very pleased indeed with what he saw of the working of the company. The only thing needed to make it a real success was to finish the job. He cordially supported the raising of fresh capital to do this.

The motion was put to the meeting and carried unanimously.

A dividend of 3½ per cent., less income-tax, on the 7 per Cent. Non-Cumulative Participating Preference shares for the year ended 31st December, 1918, was declared, and the retiring directors and the auditors were reappointed.

A resolution was also passed giving the directors borrowing powers to the extent of £500,000 over and above the amount at present authorised.

The proceedings then terminated.

London Traffic Report.—Mr. Bonar Law, in reply to a question in the House of Commons on Tuesday, said that they hoped to be able to do something in regard to the report of the Select Committee on Transport (Metropolitan Area) before the adjournment.

Municipal Omnibuses at Birkenhead.—The Birkenhead Tramways Committee have inaugurated services of motor omnibuses within the town. The Corporation have powers to run the vehicles to several out-town destinations, but they have not yet come to terms as to the mileage charge to be paid for the use of the roads.

MISCELLANEOUS NEWS AND NOTES.

Chicago Tramway Strike.—A strike of the Chicago street railway employees has been terminated by the employees accepting an offer of 65 cents per hour.

Leeds Cars for Walthamstow.—The price at which the Walthamstow Council is purchasing second-hand cars from Leeds Corporation is about £1,000 each.

Blackpool Corporation Tramway Bill for the purchase of the Blackpool and Fleetwood tramroad was passed unopposed after the third reading on July 31.

Tilling-Stevens Buses at Morecambe.—Some time ago Morecambe Corporation ordered several Tilling-Stevens petrol-electric omnibuses, and the first of these vehicles have now been delivered.

Chesterfield Corporation, as will be seen from an announcement published in this issue, is advertising for a general manager of the electricity, tramways and motor omnibus undertakings. The salary will commence at £600 per annum.

Effect of Strikes at Sheffield.—The Sheffield tramways have curtailed the services owing to the shortage of coal. Many of the Sheffield iron and steel producing firms have shut down until the miners' strike is over.

Lancashire Bus Mileage Rates.—In recommending that Mr. Jackson be permitted to establish motor omnibus services between Great Eccleston and Kirkham, Garstang and Preston, the Roads Committee stipulate for the payment of 2d. per car mile with an initial fee of a guinea per annum.

Brazil Railway Electrification.—The *Financier* states that the Paulista Railway is considering the question of electrifying a portion or the whole of its lines. A project for the electrification of the Central Brazil Railway is being considered by the Brazilian Government.

News Cars for Llandudno.—Mr. A. G. Balfour, general manager of the Llandudno and Colwyn Bay Electric Railway, Ltd., has stated to the Llandudno Council, in reply to some complaints of overcrowding, that new cars have been ordered, but delivery cannot be obtained before next Easter.

Repairs at Hull.—The City Engineer has reported that £2,000 will be a reasonable sum to provide for track repairs during the current financial year. The tramways electrical engineer considers that the cost of renewals to trucks, motors, etc., for the year will amount approximately to £8,250.

Early Delivery of American Rails.—It is stated that the London United Tramways Company have been advised that a consignment of the rails ordered by them were shipped at Baltimore on July 7, and that delivery might be expected any day. The company's officials hope to commence re-laying the track from Acton to Ealing this week.

Proposed Borrowings for Tramway Work.—East Ham Council has received sanction to borrow £23,000 for the reconstruction of tramway track in Romford Road. Doncaster Corporation has asked the Board of Trade for sanction to borrow £26,500 for the purchase of ten additional tramcars and for building a tramcar shed.

Fine for Overcrowding.—At the Dublin Southern Police Court, last week, the general manager of Dublin United Tramways Co. was summoned for permitting a tramcar on the Dalkley route to be overcrowded, and for the conductor failing to stop when signalled by the constable on duty. Fines of 10s. were imposed on each summons.

Receipts at Blackpool.—The receipts of the Blackpool Corporation tramways still continue to increase. During the period from April 1 to July 18 the increase was £11,450. The receipts per car mile reached 2s. 6½d., being 3½d. more than in the same period in 1918. The circular tours, on which special open cars are run and a fare of 6d. is charged, continue to be very popular.

Increased Wage Demand at Gloucester.—At a meeting of the Gloucester Town Council, reference was made to the further demand made by the light railway employees through the National Transport Workers' Federation for a further increase of 12s. a week for employees over 18 years of age, and 6s. for those under 18. The demand was receiving consideration, and if granted it would entail an addition of £3,500 to the wages bill.

Ashton Tramway Workers Ask Increase.—On behalf of the workers employed by Ashton-under-Lyne Corporation, Stalybridge, Hyde, Mossley, and Dukinfield Joint Tramways Board, and the Oldham, Ashton and Hyde Tramways Company, an application has been made for an increase of 12s. per week in wages. It is flat rate, intended to apply equally to all grades, and to women as well as men.

New Cars for Aberdeen.—Mr. William Forbes, general manager of the Aberdeen Corporation tramways, has been authorised by the Tramways Committee to construct six new cars at the Corporation's tramway workshops at Dee Village. The new cars will have top covers and vestibules similar to those at present under construction. The estimated cost of the new cars is £1,819 10s. each, including car body, truck and electrical equipment.

Institute of Metals.—The autumn meeting will be held at Sheffield on September 24 and 25. The programme includes visits to several well-known works and a motor excursion through the Peak district. Applicants for membership whose forms are received by the secretary, Mr. J. Shaw Scott, 36, Victoria Street, S.W 1, by September 10 will be entitled to share in the proceedings. It is expected that there will be a large attendance of engineers and metallurgists from all parts of the world.

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Rate Relief at Tramway Expense.—Out of a net profit of £5,092, Brighton Corporation Tramway Committee has allocated £5,000 in relief of rates, while at the same time pointing to the fact that they will be required to spend in the maintenance of the track a sum of £10,000 per annum for the next seven years in addition to the whole of the present accumulations in the reserve and renewals fund.

Railway Strikes Collapse.—The strikes of the London and South Western Railway engine men at Nine Elms and of the City and South London Tube Railway men have collapsed. The Nine Elms drivers struck suddenly on Monday morning, but by 5 o'clock on Thursday most of them had returned to work. The strikes were not recognised by the Executive Committee of the National Union of Railwaymen nor by the Associated Society of Locomotive Engineers and Firemen.

Tramway Accidents in London.—On August 4 a London County Council car with trailer proceeding to Westminster was overtaken near Albert Square by a car, which collided violently with the trailer. About fifteen people were injured, some being removed by motor ambulance to King's College Hospital. On the same evening a Highgate car jumped the points in turning out of Swinton Street into King's Cross Road, and mounting the pavement crashed into a shop, which was damaged. The few passengers in the car escaped with a shock, but the driver was slightly injured.

West Hartlepool Corporation Bill.—On July 31, the West Hartlepool Corporation Bill came before the Ways and Means Committee of the House of Commons, and was passed for third reading. The Bill originally proposed to confer powers to construct two tramway tracks extending southwards, but because of the objections of the Tees Conservancy Commissioners, one of the tramways was withdrawn. It was also proposed by West Hartlepool Corporation to run motor omnibuses southwards along the Tees Road to a point where the Stockton and Middlesbrough Corporations ran buses northwards. Through running will probably be arranged.

Increased Fares at Hull.—Hull tramway fares are to be increased and the stage system is to be reintroduced. There will be 1d. stages and the fare for the whole route will be 1½d., with certain exceptions. Early morning fares are to be increased from ½d. to 1d. The time-table is also being revised. The estimate for the year ending March 31, 1920, based on the old service and fares, shows a deficit of £10,495, and in addition £3,000 is required to cover the loss on the restricted service made necessary by the coal shortage, making the total deficit £13,495. The alteration in fares and services will it is hoped eliminate the estimated deficit.

Women Cash Clerks at Salford to be Replaced by Returned Soldiers. Since 1915 women have been employed at the cash receiving offices of the Salford Corporation tramways to replace men called up for service, and to this arrangement the men have now objected. A deputation from the employees recently waited upon the Tramways Committee, and after an exchange of views the Committee decided, with a view to assist in finding employment for discharged or demobilised soldiers, to instruct the general manager (Mr. G. W. Holford) to replace the present staff of female receiving clerks by male clerks, such decision not to prejudice any action of the Committee in future. The women and girls to be discharged number about sixteen.

Labour M.P. on American Rails.—Mr. John Hodge, M.P., secretary of the British Steel Smelters' Union, admits that tramway undertakings are justified in purchasing American rails. Speaking to a representative of the *Morning Post* in regard to the order recently given by the London United Tramways Company to the Lorain Steel Company, he said, "What can one say about it? Shipbuilders and bridge builders are all clamouring for steel, and so far as the tramway company is concerned you cannot blame them for buying rails in the cheapest markets. Everything is against us—the price of coal and the price of raw materials. Labour troubles are having their effect. The only thing is that we ought to protect our own market in the same way as the Americans do."

Gloucester's Application for Power to Increase Fares.—The town clerk reported to the Gloucester Light Railway Committee that he had received a letter from the Board of Trade asking for certain further information and a map, and stating that the information already supplied did not appear to show clearly that the financial position of the undertaking had yet been adversely affected by the circumstances arising out of the war. The Sheriff said that he hoped the sanction of the Board of Trade to an increase in fares would not be refused, but the Committee would, if necessary, seek a personal interview with the President of the Board of Trade, with the support of the Municipal Tramways Association. The matter was left to the chairman, the general manager and the town clerk to deal with.

Action for Damages Fails.—A decision of some importance has been given by the Judge of Blackburn County Court upon the limitation of time allowed for bringing actions for damages. A widow sought to recover £100 from Blackburn Corporation as damages for personal injuries sustained by alleged negligent driving of a tramcar. On the facts of the case, the judge thought the plaintiff entitled to succeed, but there had been delay in bringing the action, of which the counsel representing the insurance company from which Blackburn Corporation holds its accident policy took advantage. He argued that, as the claim was not brought within the period of six months, it was statute barred by the Public Authorities Protection Act. This plea the judge was obliged to allow, and he dismissed the action, suggesting, however, that the defendants should not ask for costs.

Coal Output Halved.—In a written answer, Mr. Bridgeman said on Thursday in the House of Commons that it was impossible to give daily figures of the coal output in the present disturbed conditions. The output on July 26 was not 2½ millions tons, representing a reduction of nearly 50 per cent. on the average weekly figure for the period preceding July 16. There is a reserve of coal on which in case of emergency national undertakings as well as public utilities can count for temporary supplies.

Leeds Tramwaymen and Peace Day.—By a clerical error in a paragraph in our last issue, the Leeds tramwaymen were included in the list of those who refused to work on Peace Day. A few days before the celebration the men did resolve not to work, but later Mr. J. B. Hamilton, the general manager, conferred with the secretary and the representatives of the Union of Tramway Workers. As a result of their conversations and the exercise of tact and good temper on both sides, a resolution was unanimously passed by the men to act in accordance with the National Agreement and to run the cars as usual. The management did not desire to exercise any compulsion, and invited those who did not wish to work to send in their names, so that they might be given a holiday on Peace Day. The number of applications received was remarkably small and the men worked loyally throughout the day, the cars carrying a large number of passengers without any mishap.

Bradford Tramways Come of Age.—Alderman Enoch Priestley, in moving the adoption of the Tramway Committee's minutes at the Bradford City Council meeting on July 29, said it was just twenty-one years since the first municipal car passed along Bolton Road. At that time there was a diversity of opinion, but he thought that time had justified the wisdom of those who promoted the tramway. It had not been a financial loss to the city. The ratepayers had received or had hypothecated £146,000 and in the meantime benefits had also accrued to the employees. Wages of drivers had risen from 5½d. an hour by 213 per cent., and of conductors from 4½d. by 272 per cent. The blind and injured soldiers had been carried free and soldiers' dependants had been paid £78,000. The Committee were very proud of the record of the tramways, but he wished the Council to remember that there were limits even to the success of the tramway undertaking. Alderman J. H. Palin remarked that they were all gratified by the success of the tramways from a business point of view, but they must also be judged from the point of view of public convenience. A municipality might be called on to lay down lines for public convenience and to suffer a bad financial return until a district was properly developed. He trusted that the Tramway Committee would not think they had reached finality. The majority year should mark the end of the pioneer period, and they should set themselves to work to secure the best system not only in Great Britain, but in the whole world.

PERSONAL.

Mr. J. Williams, testing assistant of the Yorkshire Electric Power Company, has been appointed technical assistant to the borough electrical engineer of Salford.

Sir Arthur Steel Maitland, M.P., Under Secretary of State for Foreign Affairs, and until recently in control of the Department of Overseas Trade, has accepted an invitation to join the Overseas Committee of the Federation of British Industries.

The King of the Belgians has conferred the title of Commander de l'Ordre de Leopold upon **Sir Herbert Austin,** managing director of the Austin Motor Company, Ltd., "in recognition of the constant and generous help given to his country in the course of the war."

Mr. Charles Aldington, C.B., has been appointed general manager of the Great Western Railway in succession to the late Mr. Frank Potter. Mr. F. J. C. Pole has been appointed assistant general manager.

Mr. J. W. Beauchamp, director of the Electrical Development Association, and recently chief engineer of the West Ham Corporation electricity works, has been presented with a handsome tantalus, to which every member of the staff and employees had contributed. Mr. P. W. Purse, made the presentation, and referred to Mr. Beauchamp's seven years' work and the difficulties with which he had to contend during the war.

CONTRACTS AND ORDERS.

Southgate Council propose to purchase three electric dust carts at a cost of £5,500.

English Electric Company, Ltd., have secured a contract for the erection of a new generating station for Blackburn Corporation at Whitebirk. The amount of the contract is £270,000.

The British Westinghouse Electric and Manufacturing Company, Ltd., have received an order from Aberdeen Corporation for twelve 35 h.-p. interpole ventilated motors, at £214 5s. each.

Birmingham Corporation have placed a contract with Edison Accumulators, Ltd., for twenty-five electric vehicles for use in the salvage department. The amount of the contract is £32,000.

Hammersmith Council have accepted the tender of Mann's Patent Steam Cart and Wagon Company, Ltd., for the supply of two steam wagons at £1,340 each.

Sunderland Corporation recently placed an order with Messrs. Bolckow, Vaughan and Company for rails, but the Tramways Committee has now been informed that it is impossible to promise delivery owing to industrial difficulties. The Corporation recently refused to buy American rails.

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FINANCIAL.

Blackpool and Fleetwood Tramroad Company, Ltd.—A dividend of 4 per cent. has been declared on the ordinary shares.

Egyptian Delta Light Railways.—A dividend of 5 per cent. has been declared on the cumulative preference shares for the year ended March 31 last.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Aug. 6 amounted to £87,136, an increase of £14,490 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to Aug. 6 (eighteen weeks and two days) the total receipts were £1,492,777, an increase of £332,126 on the corresponding period of 1918.

Lincoln Corporation Tramways.—Mr. Stanley Clegg, city electrical engineer and tramways manager of Lincoln, in his report for the year ended March 31, 1919, states that the increased fares have produced record results. It was thought by some members of the Council at the time the 50 per cent. increase was imposed that it would reduce the total number of passengers, but, i fact, there has been a large increase. The total number of passengers carried was 2,581,030, an increase of 371,744 over the previous year. The ordinary passenger traffic has increased by 21 per cent., and workmen's traffic by nearly 9 per cent. After the Armistice the service was gradually accelerated, and more mileage was run than in the corresponding time of the previous year. Working expenses have increased by about 30 per cent., which is entirely due to the increase in wages, for although the cost of materials for repairs has gone up, the difficulty of obtaining parts has had the effect of reducing expenses under that head. Since the "G.B." stud system was first installed, the total amount spent in upkeep has been £2,361, an average annual expenditure for the twelve years of £197, as against £90, the company's guarantee. It is only fair to the company, adds Mr. Clegg, to state that up to 1914 the average expenditure was £115, an amount which could not be said to considerably exceed the estimate. The gross profit on the year's working was £5,913. Debt charges and war service allowances require £2,677, leaving a net profit of £3,236 (an increase on the previous year of £1,378), which was transferred to the depreciation account. The profit balance was brought about partly by the large increase in traffic and partly by the increased fares, and with the balance brought forward from last year it will enable the Corporation to pay the whole of the cost of the conversion to the overhead system and of temporary alterations required at the car shed for the housing of extra cars. In the next few years large sums will be required to bring the system and cars into a thorough state of repair. The energy consumption per car mile was 1.328 units, as compared with 1.234 last year. The average working expenses per car mile, including power costs, were 13.44d., as compared with 10.28d. in the previous year, while the traffic revenue was 22.71d., as compared with 17.56d. The percentage of working expenses to receipts was 58.34, or slightly more than last year.

Burnley Corporation Tramways.—In the report for the year ended March 25, 1919, Mr. Henry Mozley, the general manager, states that the gross revenue amounted to £124,212, an increase of £26,732, and the expenditure to £95,939, an increase of £25,743. The net revenue was £28,273, as compared with £27,284, an increase of £988. After making provision for interest and sinking fund, rents and income tax, there is a balance of £6,020 for the reserve fund, a sum which Mr. Mozley describes as inadequate. In view of the increased cost of renewals he considers that the reserve fund should have at least £10,000 added annually. Although the car mileage was not materially increased during the year, there was an increase in the total working expenses of £27,006. This is due mainly to the increased cost of labour and materials. Other adverse influences were the interference with the service by coal saving restrictions and the changes in the staff owing to men returning from the war replacing temporary employees. All men on resuming service received increased scale pay and merit which would have accrued had there been no break in their service. The ordinary fare increase came into operation on July 1, 1918. While the effect of increased fares and increased traffic continues very favourable, the current year will have to bear an increase in wages of nearly £10,000, brought about by the National Agreement.

Year ended March 31.	1919.	1918.	1917.	1916.	1914.
	£	£	£	£	£
Total revenue	124,212	97,480	87,421	83,238	88,316
Working expenses ..	95,209	68,203	58,604	53,572	62,948
War allowances.. ..	730	1,993	3,211	4,312	—
Profit on working ..	28,273	27,284	25,606	25,354	25,368
Interest	6,247	6,590	6,401	6,552	6,939
Sinking fund	9,171	8,941	8,716	8,497	7,728
Rent for tramways worked	1,455	1,546	1,546	1,752	1,941
Income tax on profits ..	5,379	3,818	3,720	2,541	1,072
Reserve fund	6,020	6,389	5,222	—	—
Borough fund	—	—	—	6,010	7,687
Passengers carried ..	20,111,603	17,796,016	17,068,758	16,964,677	17,668,834
Fare per passenger .. d.	1.47	1.31	1.21	1.15	1.18
Car-mileage	1,595,898	1,538,471	1,548,902	1,546,389	1,754,811
Units per car-mile ..	2.30	2.28	2.15	2.16	2.22
Power cost per car-mile d.	3.416	3.022	2.786	2.657	2.74
Traffic receipts per car-mile	18.60d.	15.13d.	13.48d.	12.88d.	12.04d
Expenses per car-mile ..	14.32d.	10.64d.	9.08d.	8.31d.	8.62d.
Ratio of expenses ..	76.65%	70.34%	67.04%	64.36%	71.37%
Number of cars in stock	67	67	67	67	67

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAME.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C. ..	July 22	456	479	+ 23	16	8,599	+ 478
Aberdeen Corporation ..	,, 30	2,848	3,755	+ 907	33	29,853	+ 6,386
Ayr Corporation ..	Aug. 2	1,026	1,083	+ 57	11	10,149	+ 1,537
Belfast City	,, 1	8,403	10,374	+ 1 971	18	184,132	+ 46,284
Birkenhead Corporation	,, 3	2,453	3,050	+ 597	17½	49,801	+ 10,241
Birmingham Corporation	July 26	24,260	24,704	+ 444	17	435,703	+ 43,654
do. Motor Buses	,, 26	1,511	1,656	+ 145	17	29,445	+ 3,877
Blackburn Corporation ..	,, 30	2,504	2,565	+ 61	18½	43,727	+ 10,292
Bradford Corporation ..	,, 26	9,694	11,357	+ 1,663	18	192,367	+ 43,563
Burnley Corporation ..	Aug 2	2,698	2,980	+ 282	..	..	..
Burton-on-Trent Co.. ..	,, 3	473	545	+ 72	18	8,769	+ 1,508
Bury Corporation ..	,, 3	2,285	2,317	+ 32	17½	43,845	+ 6,673
Chatham & District ..	July 24	1,395	1,814	+ 419	29	42,634	+ 5,695
Cork Electric	,, 24	639	785	+ 147	22	18,511	+ 136
Derby Corporation ..	Aug. 2	1,653	1,921	+ 268	18	34,060	+ 7,054
Dundee City	July 30	2,055	2,880	+ 825	10½	25,119	+ 6,755
East Ham Corporation ..	Aug. 2	1,704	1,907	+ 203	17½	34,213	+ 8,026
Glasgow Corporation ..	,, 2	29,368	28,423	— 55	9	284,096	+ 28,040
Glossop (U.E. Sup. Co.) ..	,, 2	190	212	+ 22	31	6,840	+ 1,215
Halifax Corporation ..	July 15	2,553	3,513	+ 960	15½	55,134	+ 13,591
do. Motor Buses ..	,, 15	60	81	+ 21	15½	1,249	+ 325
Huddersfield Corporation	Aug. 2	4,333	4,883	+ 550	18	87,856	+ 22,243
Ilford U.D. Council ..	,, 2	1,090	907	— 183	17½	21,511	+ 3,770
Ipswich Corporation ..	,, 2	967	1,027	+ 60	18	16,293	+ 2,936
Isle of Thanet ..	July 30	503	2,107	+ 1,604	43½	29,176	+ 19,350
Kilmarnock Corporation	Aug 2	244	342	+ 98	11½	3,896	+ 546
Lanarkshire	July 24	3,722	4,718	+ 996	29	101,551	— 2,860
Leeds City ..	Aug. 2	14,403	16,886	+ 1,983	18	300,774	+ 73,304
Leicester Corporation ..	,, 2	4,919	5,889	+ 970	..	..	..
Leyton U.D Council ..	July 31	2,600	3,169	+ 569	18	56,744	+ 17,294
Liverpool Corporation ..	Aug. 2	20,470	23,798	+ 3,328	30½	672,015	+ 131,336
London County Council ..	,, 6	72,646	87,136	+ 14,490	18½	1,492,777	+ 332,126
Maidstone Corporation ..	July 31	291	390	+ 99	17½	6,753	+ 1,706
Manchester Corporation	,, 2	26,401	29,389	+ 2,988	18	547,427	+ 97,594
Newcastle-on-Tyne Cor.	,, 2	9,609	9,194	— 415	18	172,692	+ 11,901
Northampton Cor. ..	July 27	867	1,206	+ 339	16	21,546	+ 6,904
Nottingham Corporation	,, 31	6,131	7,095	+ 964	18	125,765	+ 22,527
Oldham Corporation ..	,, 27	3,649	4,582	+ 933	18	79,070	+ 16,777
Reading Corporation ..	,, 31	1,423	1,649	+ 226	17½	28,117	+ 5,478
Rotherham Corporation	Aug. 6	2,513	2,032	— 481	18½	40,561	+ b 224
Sheffield Corporation ..	,, 3	13,123	16,625	+ 3,102	18½	316,473	+ 64,726
Southampton Cor. ..	July 30	2,748	2,514	— 234	17½	48,150	+ 3,780
Southend-on-Sea Cor. ..	,, 23	1,492	3,057	+ 1,565	17	33,749	+ 15,978
South Shields Cor. ..	,, 19	1,269	1,201	— 68	16	21,826	+ 3,815
Sunderland Corporation..	Aug. 3	2,216	2,958	+ 742	18	52,072	+ 14,243
Torquay Tramways ..	July 24	1,065	1,422	+ 357	29	28,718	+ 5,027
Tyneside Trys. & Trmrds	Aug. 9	1,112	942	— 170	2	1,176	— f 379
Wallasey Corporation .	,, 2	2,508	2,065	+ 462	17½	46,781	+ 12,745
Walsall Corporation ..	July 26	1,237	1,320	+ 83	17	23,595	+ 3,119
Walthamstow U.D. Coun.	Aug. 2	1,646	1,765	+ 119	19	31,968	+ 5,496
Warrington Corporation	July 24	745	691	— 54	16	14,475	+ 2,346
West Ham Corporation	July 31	4,881	5,227	+ 346	17½	96,079	+ 19,326
Wolverhampton	Aug. 6	2,354	2,345	— 11	18	37,001	+ 4,848

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	July 29	£56 375	£59,713	30	£1,657,954	+ £1,624
Ballarat and Bendigo(4 wks)	May 25	3,256	3,266	8	7,557	+ 176
Brazilian Traction (Mirs.)	May	9,080,000	9,162,000	21	44,594,000	+ 3,988,000
Brisbane	Apr.	35,580	32,775	17	151,110	+ 13,541
British Columbia .. $	May	486,876	628,847	47	6,650,954	+ 1,153,290
Buenos Aires Lacroze ..	July	41,145	45,222	4	45,222	+ 4,077
Burmah Tram. & Light Rs.	June 30	31,158	41,518	48	406,408	+ 106,471
Calcutta .. .. Rs.	Aug. 2	78,862	37,955	30½	..	+ 354,800
Carthagena and Herreries	July	5,491	4,183	30	20,974	— 12,149
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	July	1,968	2,687	52	24,689	+ 6,760
Hong Kong.. .. $	June21	12,693	15,350	25	357,601	+ 25,495
Kalgoorlie	March	2,700	2,653	13	7,493	— 102
La Plata	July	6,721	5,317	31	32,774	+ 2,840
Lima	May	42,949	42,968	22	110,666	+ 8,925
Lisbon .. .. Escu	Mar.	288,299	276,625	..	..	..
Madras (2 weeks) Rs.	June 30	40,270	44,249	26	453,043	— 30,367
Manila .. .. $	May	175,500	183,050	21	1,046,433	+ 199,183
Montevideo	,,	32,301	37,382	31	265,287	+ 28,948
Para	June	25,445	24,647	30	172,077	+ 2,541
Pernambuco	Aug. 8	4,082	4,091	30½	162,014	+ 23,580
Peruvian .. .. $	July	987,300	1,058,730	..	..	— ..
Rangoon	June	6,163	6,276	26	33,626	+ 927
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore .. .. $	June 21	12,690	15,628	25	385,872	+ 47,672
Toronto .. .. $	May	1,090,747	1,032,717	21	5,290,599	— 29.688
Winnipeg $	M	280,985	248,191	..	..	..

CARS, MOTORS, CONTROLLERS.

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THE Tramway & Railway World
WITH MOTOR TRAFFIC SECTION

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ADVANTAGES OF LIGHTER TRAMWAY CARS.

An American Innovation.

It may seem at first sight a comparatively slight matter to chose between using a tramcar of large capacity and a car of smaller dimensions. If you have a great volume of traffic, use a large car, and if the traffic is never very great, a smaller car will serve. This appears to be a perfect adjustment of means to ends, and satisfactory to the most practical of minds. But somehow it does not work out quite in that way. Fifteen or sixteen years ago, certain large tramway undertakings, in the plentitude of their power resources, determined that their cars should lack nothing in the way of passenger capacity. Accordingly, they built huge double-deck cars, running on bogie trucks, and consumes power extravagantly. During two-thirds of the hours of running, the huge vehicles carry less than half their capacity. Some authorities have before their eyes a demonstration, in the shape of omnibuses, that a vehicle capable only of carrying 34 passengers could be made to pay. On the other hand, there is the problem of the "rush hour," and that, with its belligerent clamour, must be solved at all hazards. That the big car is of enormous advantage in dealing with that particular difficulty cannot be doubted.

Enquiry and invention have, however, lately been nibbling at the structure upon which the big-car policy is based, and what looked like the bed-rock of

A Light-Weight Car of a Type Popular in America.

capable of seating 70 passengers or more. To increase the weight of each vehicle from about nine tons to over fifteen tons might have seemed rash, if anyone had stopped to argue the point, because of the burden imposed on tracks and power supplies, but the tramway authorities then had confidence in the structure of their tracks and ample resources in electricity. Their eyes were fixed on the aim of ridding themselves of the worry caused by congested traffic, and the big tramcar offered a solution of the difficulty. In that period the large tramcar became the fashion, and up till recently few doubted the wisdom of the big-car policy. Looking at the subject in the light of experience it is clear that the wisdom of that policy is at least open to question. It cannot be doubted that the heavy weight of the cars breaks down tracks, grinds down rails, and economics is beginning to give signs of disintegration. American tramway journals have been full of this subject during the past year. There is in fact an enthusiastic movement, which seems to grow with experience, in favour of what is called the "safety" car—a light-weight single-deck, vehicle carried on four wheels, which is capable of being operated by one man. There can be no doubt that this is an excellent type of car for building up traffic on quiet sections. Even when worked by two men the car has been found economical and advantageous in other ways. The favour that it has won in America is a very significant symptom, and should attract serious enquiry from British tramway men.

Operating conditions in the United States differ, of course, very greatly from those with which British

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tramway managers have to deal, and arguments based on results obtained there might prove fallacious if applied to tramway operation in this country. The better plan will be to find out what exactly is the "safety" car, and how it can be utilised here, if at all.

The American "safety" car has been so-called because it is equipped with control devices designed to protect both operator and passenger. Without a clear view of the car structure, however, description of these devices would be confusing, and we note first the composition of the car body itself. The framing of the vehicle is steel. Light steel plates riveted to angle side sills, flat bar belt rails, T-section side posts, angle corner posts and angle seat rests form the plate girder side structure. Cross sills, end sills, platform sills, and "bumpers" are composed of channels. Cross members are attached to the side sills with angles, and those at the truck bearings are strongly reinforced.

The T-section side posts and angle corner posts extend in a single piece from side sill to side sill, and form the ear-lines. The posts are encased with ash, grooved for the sash and curtain runways. Ash is also used for the rafters, which are bolted to the steel ear-lines, and serve for attaching the tongue-and-groove poplar roof boards. Ash headers are attached to the angle corner posts and supported by 1 in. pipe stanchions.

Steel letter panels are riveted to the posts and are pressed outwards at the bottom edge to form a capping for the upper sashes. The sashes, eight to each side of the car, are set in a frame extending from the door to the end post. The lower sashes are capable of being raised 25 inches, and are provided with lock and rack for holding them at various heights. Three windows at each end, also fitted with racks, are arranged to drop into pockets.

The doors of the cars are of the outward-folding type, hung on ball-bearing hinges bolted in place. Oak steps, with safety treads, are hung on malleable hinges equipped with balance springs and arranged to act in conjunction with the doors.

Inside arrangements of the car have been planned so as to afford comfortable sitting room for 32 passengers. A transverse seat was specially designed for the "safety" car of a lighter weight than the usual reversible-back seat. A pressed steel pedestal supports the seat at the aisle end and a pressed steel wall plate is provided at the other end. The back and "cushion" are composed of three-ply hardwood veneer, covered with canvas-lined, twill woven rattan, and framed in cherry wood. The mechanism of the seat comprises a double-lever arrangement at each end of the back, a sliding rocker-shaped casting supporting each end of the cushion and shifting it by means of the cranks operated by the double levers and made to work in unison by a shaft. In addition, there is a simple hinged connection of the cushion with one end of the rocker castings, so that the latter may be folded up and give clearance for sweeping the car floor. The seat has a 16 in. by 30 in. seat or cushion, a 16 in. by 29 in. back, and an overall length of 32 inches.

The fittings of the car are carefully designed. The main features are a finely diffused lighting installation, conspicuous route and destination signs in illuminated casings; drop sashes in the ends of the car; a ventilating system consisting of eight exhaust type ventilators in the roof, and spring roller curtains for

Interior of Light-Weight Single-Truck Single-Deck Car with Seats for 32 Passengers.

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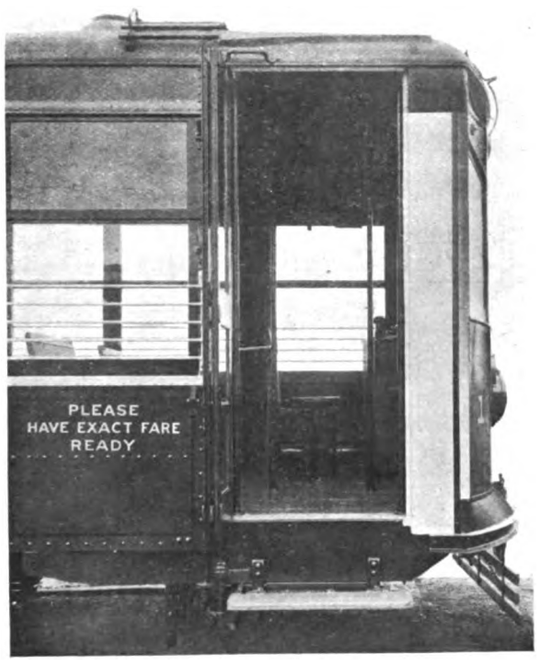
the windows. Spring roller curtains are also provided at the back and side of the motorman's position, so as to cut off window reflections of interior lights, which would otherwise confuse vision at night.

Over the centre windows at each end of the car are installed two 4-in. semaphore lenses for the tail and



Enclosed Platform showing Controller Handle and Driver's Seat.

The Controller cuts off current, opens the doors at each end and lets down the steps.

marker lights, which are provided with three different colours of glass, with fittings.

The safety control devices of the car are pneumatically operated and act in such a manner that, should the motorman become suddenly incapacitated, or remove his hand for any reason from the controller handle while the brakes are released, the power will be automatically cut off, the brakes applied, sand blown upon the rails, the front door opened, and the backdoor unlatched. By removing the brake-valve handle to the emergency position, the operator can, in the case of an obstacle on the track or other emergency, shut off the power, apply the brakes and sand, open the doors and let down the steps, at one operation. This combination of control in one and the same brake valve is also taken advantage of in regular service operation, so that the mechanical devices to be manipulated are reduced to a minimum, thus obviating the tendency to produce confusion. A diaphragm type of governor is used, without valves, and the safety valve is of the approved poppet type. There are six positions to the brake valve through which the operator not only controls the brakes, but also the doors, steps, and sand valves. The doors are closed and the steps taken up automatically by the letting-in of power and before the starting of the car, and they cannot be opened until the car comes to a dead stop. In addition to this important safety feature, there is also provided an emergency valve, which applies the brakes, opens the front door, lowers the steps, and blows sand on the rails, should the emergency line of the brake valve be ruptured. A hand brake is also installed at the centre of the platform close to the end lining and connected to the brake levers in the usual manner. The brake has a ratchet wheel, dog and floor plate at the bottom, and is operated by a 12-in. drop handle with ratchet mechanism.

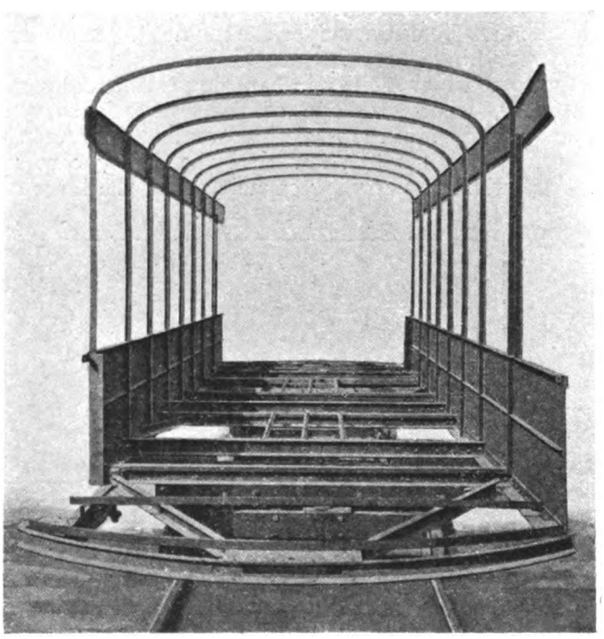
The main dimensions of the "safety" car are the following :—

Length over all, 27 ft. 9½ in.
Length over sheathing, 26 ft. 9½ in.
Length from corner posts over end sheathing, 4 ft. 6 in.
Length over corner posts, 17 ft. 9½ in.
Width of car over all, 8 ft.
Height from rail to top of flooring, 2 ft. 4 in.
Height from rail to top of roof, 9 ft. 9½ in.
Height from floor to top of window rest, 2 ft. 0¾ in.
Height from floor to centre of arch, 6 ft. 6 in.
Clear width of door opening, 2 ft. 6 in.
Width of aisle, 22 in.
Seat spacing, 2 ft. 4½ in.

The weight of the "safety" car, and its equipment in running condition totals 13,500 lbs. of which the body weighs 6,300 lbs., air apparatus 1,100 lbs., electrical equipment 2,000 lbs. The "safety" car is carried on what is known as the "Brill Special 21-E Truck," which is in most respects similar to the regular type of this well-known truck. The principal difference is the provision of four 24 in. diameter wheels giving a low step height. The arrangement of the body springs is designed to carry 75 per cent. of the load at the end of the truck, and by this distribution of the load, together with combining spiral end-springs, steady and easy running is secured.

The small motors used have an hourly rating of 25 h.p. on 600 volts with an input of 37 amperes. The continuous rating for a temperature rise of 65 degrees C. by thermometer is 35·0 amperes on 600 volts. Ventilation is obtained by a double or multiple fan at the pinion end of the armature. The clearance under frame with 24 in. wheels is $3\frac{5}{16}$ in. and under gear case $2\frac{23}{32}$ in. Average trolley potential is 500 volts acceleration and braking 1·5 miles per hour per second.

Though the "safety" car is novel to this country, it is by no means in the experimental stage. In the



Principal Frame Members of Light-Weight Car.

United States there are no fewer than 80 electric railway undertakings utilising these vehicles, and the uniformly favourable reports of users have excited great interest. As we have premised, however, methods which produce highly satisfactory results under United States conditions may fail in this country. It is necessary to

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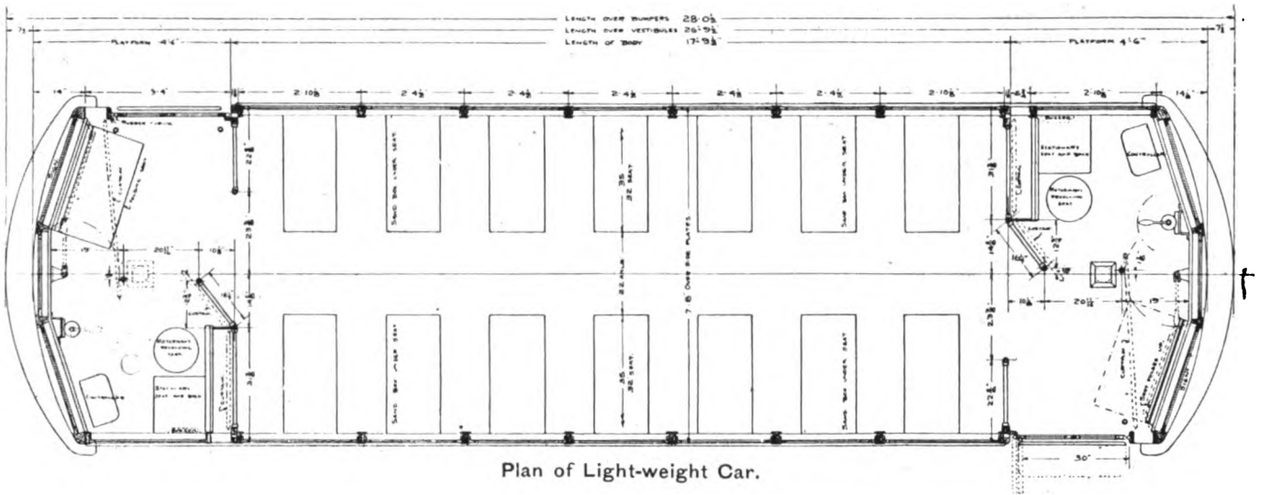
examine the proposition from the standpoint of the tramway manager in Great Britain. The main factors to be considered are rapidity of service, power consumption, wear and tear of track, and expenditure in labour and materials.

As it is obvious that the power required to drive a car weighing 6 tons is less than the power needed for a car 15 tons in weight, debate of that aspect of the subject is



Plan of Light-weight Car.

quite superfluous. Many provincial tramway authorities, it may be admitted, use cars weighing only about 10 tons, and then the trailer comes in to complicate the subject; but the "safety" car must be assumed to be a lighter vehicle than that commonly used in tramway operation, and the difference in weight, so far as it is a factor in power consumption, tells in favour of the lighter car. According to experience in the United States, the power-saving effected by their light cars, while maintaining service equal to that of the heavy cars, has amounted to between 50 and 60 per cent.

Discussion of the wear-and-tear problem, the questions of maintenance and renewals costs, and all such details may be put aside for the moment. Preliminary to everything, tramway authorities in this country have to consider facility in handling traffic and earning capacity, whatever type of rolling stock they use. Careful analysis of the statistics compiled from American experience seems to show that the safety cars have a greater all-day earning capacity then the large cars, because they are lighter, easier to handle in stopping and starting, and may give a service with fewer intervals and shorter headway, at lower cost. For "rush" hour service, however, the larger car holds a distinct advantage. During the hours when traffic is light, the large cars run more than half empty. To reduce the costs, the intervals between services are lengthened, with consequent discontent and complaint on the part of the public. Undoubtedly, the long intervals of time between one car and another lose traffic. The would-be traveller looks along the track and sees no car in sight; he or she starts to walk to the next stage, and may even let a half-empty car pass between one stopping-place and another. The unbiassed conclusion, therefore, would appear to favour a service of mixed large and light cars. With a fleet of light, small cars at his disposal, the traffic manager of a tramway system could fill up his time table, reducing the intervals of service on every route, while lessening the costs of running over all, and pick up traffic otherwise lost.

CONTINUOUS CURRENT OVERHEAD SYSTEMS FOR SUBURBAN RAILWAY ELECTRIFICATION.

By E. Goolding.

It may be taken that 80 per cent. of the railway electrification work has been done on the continuous-current third-rail system, high-tension three-phase current being distributed from a main generating station to outlying sub-stations, and these transformed to low-pressure continuous current for supplying track conductors. There are many designs of conductors, and their position varies almost in direct proportion to the number of lines equipped, but the system continues to hold its own up to the most recent work. The low-tension continuous-current system, with a steel conductor rail, as now used, presents great economic advantages, and the various other systems (such as three-phase, single-phase, series constant current, high-tension continuous current, or the three-wire systems) for equipping the track and operating the rolling stock, form but a small percentage of the work done. "The proof of the pudding is in the eating," and the adherence to continuous current as the propelling medium must be looked upon as "the survival of the fittest."

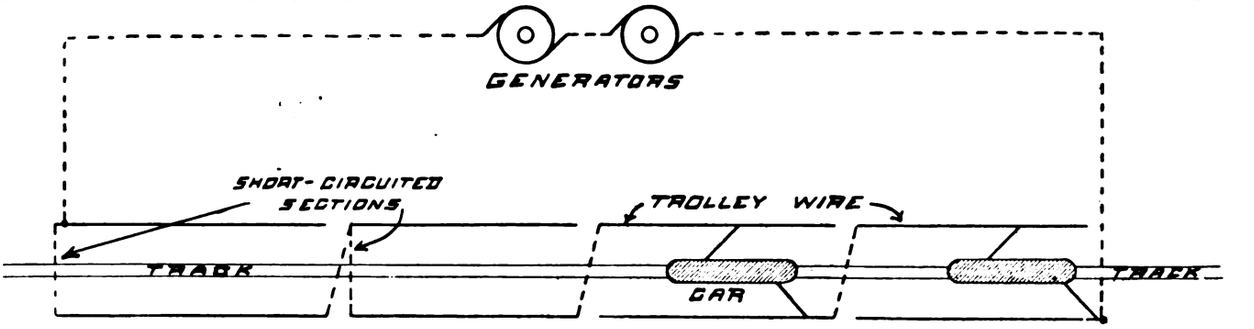


Fig. 1.—Series Constant Current System.

Starting with this as an obvious fact, and looking at things broadly, the question arises as to what

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improvement can be made on the present track equipment methods in view of future developments. The most important is to reduce the encumbered condition of the permanent way by a new design of steel conductor taking less space, or, better still, by increasing the voltage and placing a copper conductor overhead. This has previously been suggested by the series constant-current system and was used in the early days of tramways, but the disadvantages were such that in practice it has not found favour. For instance, the two conductors were divided into sections throughout, as shown in Fig. 1, but this involved complications, the necessity of careful insulation of motors, which is no easy matter, while it will be seen that double contacts are also required, there being no earth return. A three-wire system, which is almost universal for lighting and power, is another method of using low-pressure continuous-current machines in series, thereby doubling the voltage for economic distribution. It has been successfully applied to railway electrification, and in this work the middle or neutral wire can be dispensed with, as the track (already laid) answers this purpose. The middle or neutral wire is usually half the area of the outers, since it only deals with the out-of-balance current, and dispensing with this middle or neutral conductor considerably adds to the economic advantage. The total saving with this system represents about 70 per cent. in copper for a tramway layout. The usual trolley wire potential of a tramway is 550 volts to earth, but by running on the three-wire system this voltage is doubled, and two cars (each taking 550 volts on the motors) are run in series across trolley wires at 1,100 volts. This system was described in some detail as to design and operation in THE TRAMWAY AND RAILWAY WORLD of February 4, 1909, and it would appear from recent practical railway electrification that if a similar method could be adopted with modifications found necessary to meet heavier currents considerable advancement would be made. The suggestion is shown in Fig. 2, and is not a radical deflection to entirely new ideas, since it has been found effective for heavy train service where a third rail is used; also, it must be remembered that a modified form of tramway overhead equipment is in vogue for electric locomotives both in subways abroad and goods sidings in this country. Take the 800-volt third-rail continuous-current system recently installed on some railways. The area of the conductor rail is, say, 8 sq. in., or equal to ·8 sq. in. of copper; to instal this system on the three-wire overhead system, using the track as the neutral or return conductor, we should obtain 1,600 volts between the conductors, and these need therefore only be equivalent to half the area of third rail, or ·4 sq. in. The conductors at this voltage are only about three times the area of an ordinary trolley wire. There are several points to be further considered, and

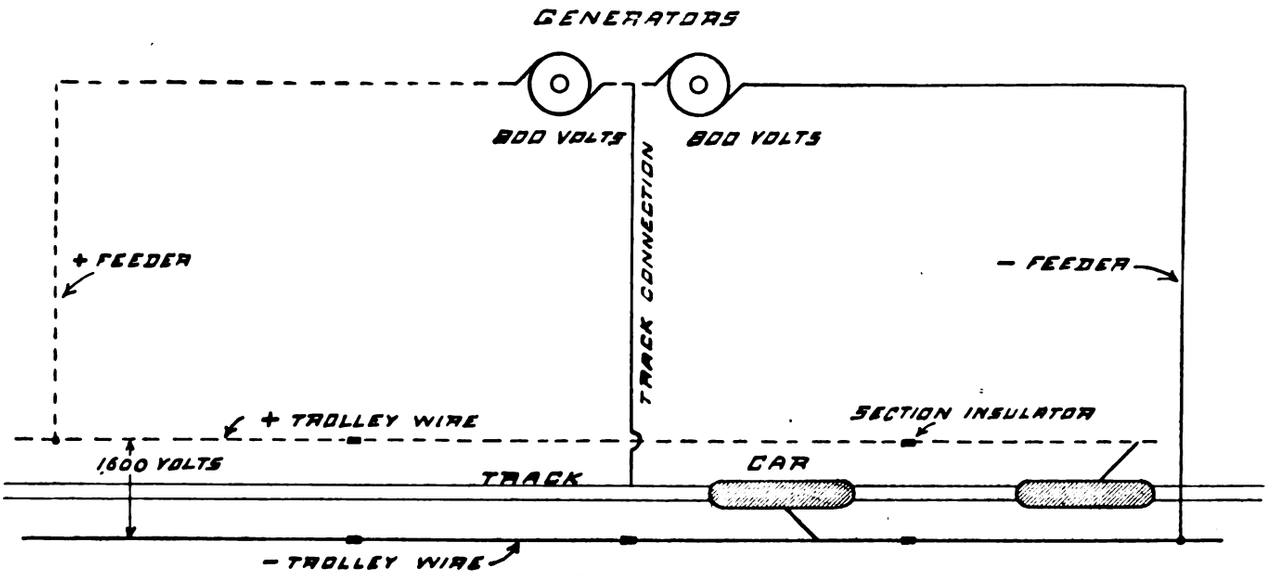

Fig. 2.—Three Wire System.

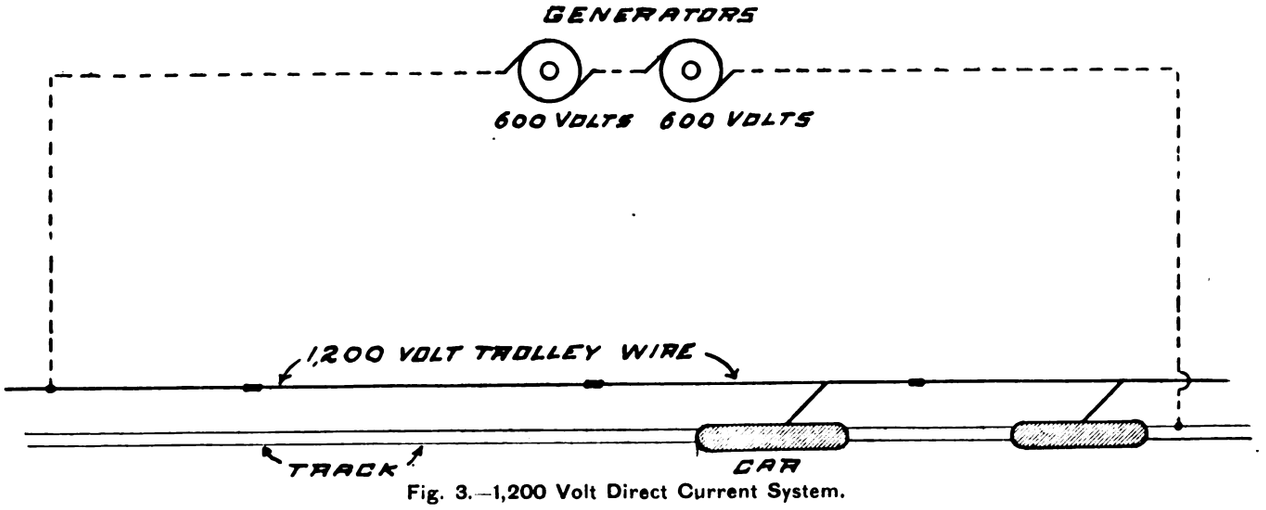

Fig. 3.—1,200 Volt Direct Current System.

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one is that owing to the high speed and comparatively heavy current, the overhead conductor must be kept fairly level, hence single catenary suspension should be adopted, which enables hangers to be attached equidistantly along the wires—say about 15 ft. apart—up to the messenger wire, thereby adjusting the conductor to a level contact for the bow. On ordinary tramway overhead work, the trolley wires are supported every 120 ft., but the sag is very considerable, especially when the line is loaded in hot weather. It is with the object of avoiding the wear and tear and sparking of the bow collector that would be caused when passing suspension points at high speed that catenary suspension is necessary. The question of contact is of importance, owing to the heavy current needed during the starting and acceleration, and the adoption of double trolley wire is suggested as at present used on certain lines, with the wires 9 in. apart, giving the necessary contact area for the bow.

Assuming that we wish to obtain an area equivalent to a 100-lb. conductor rail at some busy section, the overhead wires, if run in pairs on the three-wire system, would each be equal to one-fourth the third rail conductivity, or only ·25 sq. in., about $\frac{11}{16}$ in. diameter, which is a convenient size for handling and fittings. The return or balancing current, which may occur through an uneven load on either side of the system, returns as previously mentioned through the neutral or track rails. In practice it will be impossible to maintain the same load on each side of the system, but generally speaking, under ordinary conditions of running, only a small return should be expected, which I believe was found to be the case with the City and South London Railway, where balancers were dispensed with, as it is found that the traffic practically balances itself.

The great saving due to economy in distribution with this system has always been admitted even with a neutral wire, which has been dispensed with on railway work, and the track losses as a conductor are negligible. In addition, the heavy and costly bonding usually needed can be reduced, with the three-wire system, to half or sufficient to assure a continuity of the track as a whole. The efficiency claimed on the City and South London for the whole line between generating stations, bus-bars, and locomotive, is, I understand, some 90 per cent. where a third and fourth rail is installed, and as a system it appears to be giving excellent results.

From several years' experience in the electrical equipment of permanent way the writer can definitely say that although perseverance and experience have enabled the third rail to be successfully used at some of the most complicated junctions and termini, it becomes an impossibility to instal a fourth rail. The gaps that have to be left in the third rail often spread over 200 ft. owing to the necessity of avoiding frogs, crossings, footways, and signalling gear, etc., and even with a third rail it becomes an art to carry out repairs and ballasting of track. The gaps that would occur with a fourth rail would be nearly double, let alone the heavy expense and work of linking up by underground cables the short lengths of rail to obtain continuity. A single motor coach would be unable to coast such a distance; it would require a six-coach train to negotiate the track under such conditions. It is with the object of obviating such obstruction and difficulty on the permanent way that overhead equipment is suggested. There are cases where bottle-necked termini present such complicated networks of track that the sectioning and balancing of load on a three-wire system would call for special consideration.

Before leaving this subject it may be interesting to state that over twelve lines, using 1,200 volts overhead direct-current system, are in active operation in America—as shown in Fig. 3. The high-tension three-phase current is supplied to the sub-stations from a main generating station; at the sub-stations the current is transformed to 450 volts for the rotary converters, two of which, generating 600 volts each, are connected in series on one base and insulated from earth and supply current to overhead lines at 1,200 volts. Of course, regulations as to 7 volts' drop in earthed returns do not exist in America, and conditions as to high-tension overhead conductors are not so stringent as on this side. The suggested running of machines in series and increasing the pressure by double has the effect of minimising troubles likely to occur through excessive earth return or drop. Correspondingly the motors of the two or four equipments are permanently run in series, which gives a voltage across terminals of each motor equal to half the line voltage.

SALFORD ILLUMINATED CAR.

Beauty is not one of the attributes of the ordinary tramcar, though it has qualities of aspect as a thing of speed not altogether unpleasing to the artistic sense. For a picture, however, the four-in-hand, with its splendid team of horses, is more suitable. And yet on many a tramway route during the peace celebrations, the illuminated tramcars have given much pleasure to the public. In their broad mass and square lines, the tramcars lend themselves to the purpose of the illuminating artist with singular felicity. A fine example of what can be done with a tramcar as an expression of rejoicing is the illuminated tramcar of Salford Corporation, shown in the accompanying illustrations. Lines of electric lamps of varying voltage and different colours trace out artistic designs all over the car body. On the side panels are shown the arms of all the Colonies, framed in borders of light, and trophied groups of the flags of the Allied nations are displayed by illuminated devices on the top deck boards. Electric lamps form the figures 1914–1919 on both sides of the car, while portraits of the King and Queen, Foch, Beatty, and other notable personages shine from the windows. On the top of the car at one end stands the figure of "Peace" in a canopy of flower-like lights, and at the other end the figure of "Justice" similarly enshrined. Front board and tail board blaze with a shield of clustered lamps, surrounded by the flags of Britain, France, Belgium, and the United States. In all there are 1,670 lamps on the large vehicle, and palms, flowers and foliage fill in the spaces with colour and greenery. Graceful festoons of trailing plants cover the standards, and the side windows and interior are profusely decorated with flowers, the gift of the Salford Parks Committee.

Needless to say, the illuminated car created great enthusiasm among the citizens of Salford during the three evenings it travelled the whole round of the tramway area. Mr. G. W. Holford, the general manager of the Salford Tramways, and his assistants, seem to have devoted much care and artistic taste to the designing and decoration of the illuminated car, and they are to be congratulated on the success of their efforts.

Belgian State Contracts.—The "Bulletin Commercial" of the Belgian Ministry of Foreign Affairs announces that applications for specifications, plans, etc., relating to tenders invited by the Belgian State Railways and by the Docks and Harbours and Post and Telegraph Authorities should be sent to the "Chef du Bureau des Renseignements concernant les Adjudications Publiques," 15, Rue des Augustins, Brussels. Plans and models relating to these adjudications are also on view at that office.

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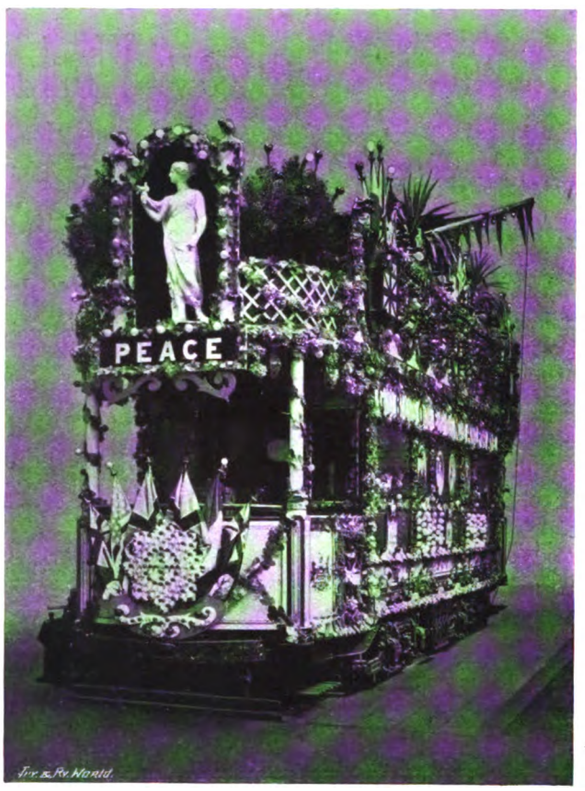

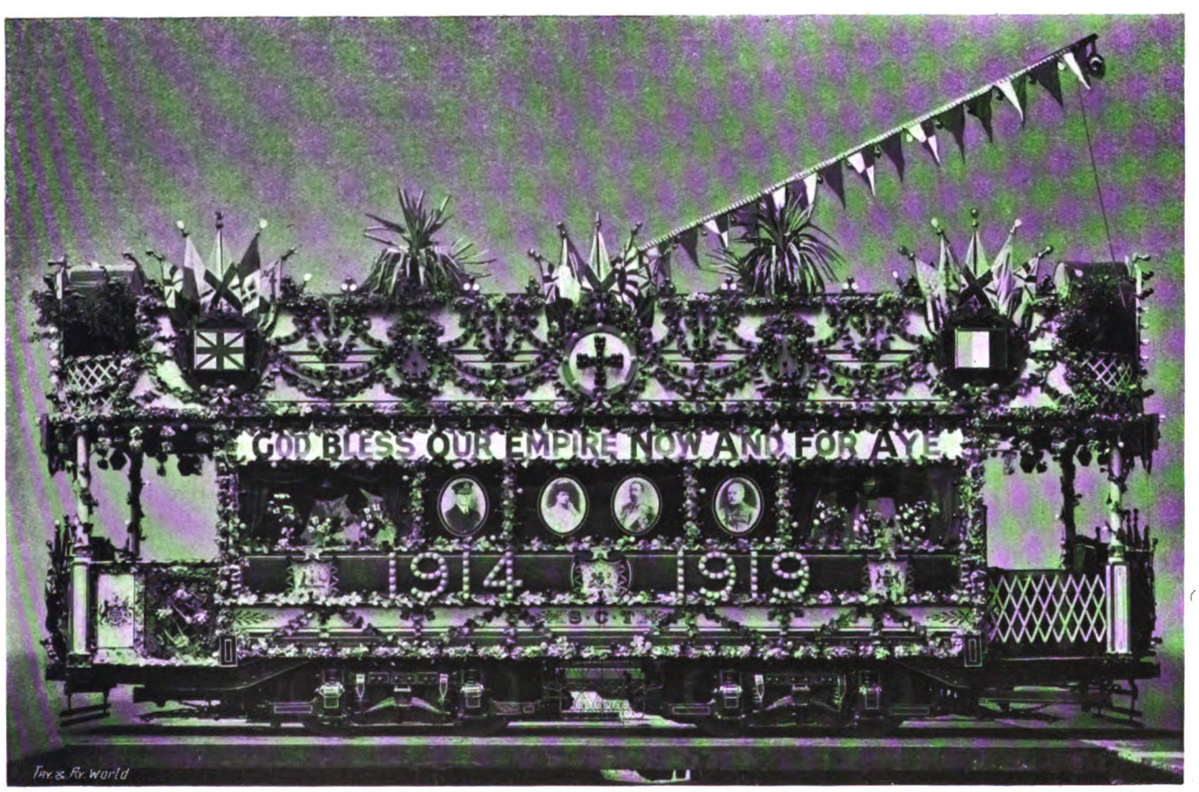

Decorated and Illuminated Car—Salford Corporation Tramways.

This car was run on three evenings in connection with the National Peace Celebrations.

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THE EDITOR will be glad to consider articles by experts. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, AUGUST 14, 1919.

The New Transport Ministry.

Recognition of the Ministry of Ways and Communications Bill has come swiftly, and the measure has passed through the various stages without serious amendment of its essential provisions. Before it has been ushered into legal existence, the Ministry is actually part of the administrative machinery of the nation. Proposals for light railways, tramway borrowings and extensions, and road reconstruction, are being referred constantly to the decision of a Ministry not at the moment legally existent. Although at the moment of writing the Bill is passing through the House of Lords, little emphasis may be laid upon that fact. The measure will be placed on the Statute Book substantially unchanged. When the Transport Bill was in its early stages, there was much talk about the setting up of an autocracy, the danger of putting so much power into the hands of a single Minister, and the dire results likely to ensue, but the event has proved that the Minister is more likely to become the slave of his office than its despot, the calls upon his judgment and decisions having already accumulated into a formidable task. Excepting that the business is greater, more complex, and perhaps more directly concerned in labour problems, the Ministry of Transport differs in no essential aspect from the Ministry of Agriculture, of War, or the Treasury, and may even be likened to the Postmaster-General's Department. Under the ægis of such a Ministry, tramway and allied transport undertakings may well be content to work out their destiny. Even a number of railway and tramway managers have had to be taught by the logic of necessity that there is no essential antagonism between one form of traction and another, but that tramway, trackless trolley, motor omnibus, light railway, and underground railway system may implement one another with mutual advantage. Recently, applications for Parliamentary powers to run omnibus services auxiliary to their tramways by local authorities have become very numerous. This is a sign of vigorous health which will be still further conserved by the unification effected by the Ministry of Transport. Instead of a Local Government Board set like a watchdog to keep them in the narrow way of civic regulation, and a Board of Trade equally restrictive, tramway authorities will have the aid and furtherance of a Ministry appointed for that end. The gain in the change of attitude is very great, and it ought to impart abounding confidence in the future of transport. A certain degree of caution, however, may also be advisable. In the exercise of his wide powers, the Minister of Transport may favour modes of traction not in the hands of local authorities, and the appeal from him to the higher authority of Parliament may be difficult to carry through, advisory committees notwithstanding, because, if the forecast sketched is correct, the Government of the day must stand or fall by the Minister. Under normal circumstances, the House of Commons will refuse to precipitate a general election for the sake of a local tramway undertaking, and therefore the Minister's veto is likely to stand. There is no benefit to be gained from Government, however, without payment in the shape of surrender of liberty of action in one direction or another. Taken as a whole, the Transport Ministry is a magnificent instrument which may become the means of organising the whole of the transport facilities of the country, and redeeming the service from the reproach of chaos and comparative inefficiency under which it now labours.

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Outlook for "A Starved Industry."

It is no exaggeration to refer to tramway undertakings as a starved industry, even though the reference be to pre-war finances. The term was used by Mr. Madgen in drawing the attention of the Tramways and Light Railways Association to the problems facing them. In substantiating the phrase, Mr. Madgen unwittingly shattered the reason advanced by Sir E. Geddes, in introducing the Ways and Communications Bill, for leaving municipal tramways out of the measure, namely, that they produce a gross profit of 7 per cent. of the capital expenditure. That figure represents the gross profit on both municipal and company undertakings. Allowing 4 per cent. for depreciation, Mr. Madgen gave the average nett yield on the capital invested in tramways as 3 per cent. As he observed, that result proves tramways to be a starved industry, for a return of 3 per cent. is not sufficient to attract capital or to justify its expenditure, nor does it provide a margin for enterprise in improvements and extensions. By increasing short-distance fares, in order to meet the 100 per cent. increase on items affected by post-war prices, the author estimates that a yield of 6 per cent. would be produced. Not the least beneficial effect would be the further dispersal of population from crowded industrial centres. Practical methods were suggested for overcoming two hindrances that operate against the setting up of this rational fare system. The first obstacle is that fares are generally limited to a maximum of one penny per mile, while at present costs there must be a charge of more than one penny. This may entail action on the part of the Government and Parliament, but as the Transport Bill includes a provision for regulating tramway fares among others, the desired alteration would be by administrative action. It would be a great advantage if such action would over-ride the numerous provisions in special Acts and Orders, and agreements between companies and local authorities setting out scales of fares or maximum fares, which have often been wrung from the companies. For the purpose of educating the local authorities and if need be the Legislature, a plan is proposed that has proved successful in the United States, to wit a campaign of publicity. The same remark is applicable to London as far as omnibus fares are concerned, for, apart from Members of Parliament who have an eye to a General Election in the near future, we have neither seen nor heard of complaints. On the contrary, passengers consider themselves fortunate to have so rapid and so cheap a service. It is encouraging to note that none of the managers who discussed the paper objected to the author's main conclusions, Mr. Dalrymple predicting that even two or three years hence every undertaking would require a much larger revenue from fares to meet the expenditure. To a large extent the demands of labour are responsible for the present situation, as was shown by the revelation concerning Peace Day traffic in London. On that occasion the L.C.C. receipts were about £14,000, while the cost of labour alone, with double pay for the day, was £18,000. If a public holiday is to be made an occasion for holding tramways to ransom, the balance will have to be properly adjusted by making an extra charge for those occasions, as suggested by Mr. H. England in his admirable paper on "Post-war Problems." It is worthy of note that Mr. England, who has had a wide experience in dealing with local authorities and with the public, was even more insistent than Mr. Madgen in urging the need for a publicity effort, and it is to be hoped that the two tramway organisations will not permit the matter to drop.

The London Traffic Report.

Legislation in a hurry is generally productive of results that call for amendment. Often as we have urged the translation into an Act of Parliament of the recommendations of the Royal Commission on London Traffic in 1905, and urgent as is the need for a Traffic Board, it is to be hoped that the Government will not be precipitate in dealing with the report of the Select Committee on London Transport. The document bears the impress of the chairman, who has brought to bear upon its hurried production the methods of a daily newspaper. In his efforts to improve upon the deliberate procedure hitherto adopted in such inquiries, he has produced a report that in every respect displays the characteristics of the average newspaper investigator. Incomplete examination of the

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facts and hasty generalisations have led to conclusions that will not be found to be supported by the evidence, which has yet to be published. That point has naturally been emphasised by the interests affected, notably by the London Traffic group, and it is not too much to hope that the Government will arrive at a similar opinion in the examination of the report which, as the leader of the House of Commons has stated, they are now engaged upon. Moreover, there is no indication that the report was unanimously arrived at; the document states that the Committee "have agreed to the following report." So great was the haste for publication that even the names of the members constituting the Committee were omitted, while on page 5 by careless drafting it is gravely proposed that the Board should have power "to sanction all abuses arising out of street traffic." It is hardly probable that the members of the Committee have been unanimous in the proposal that the London Traffic group should have no representative upon the body of five members forming the Greater London Traffic Authority. The group carry the great majority of passengers and have expended capital more than three times the amount of the outlay of the municipal tramways. To give to the group a representative would not only be fair, but it would be highly advantageous in the public interest, especially as the report admits "that the larger issues of London transport to a considerable extent involve expert problems." Such representation is essential if the authority is to discharge with hope of success two alone of the 21 functions allotted to it by the report, viz., (1) to prepare and keep up to date a general plan to which all London transit facilities should conform and bring before the authority concerned the necessary steps to be taken to secure improvements, and (2) to direct the co-ordination of the rates and services of existing means of transport.

Great Task for Experts.

The language in which the Committee clothe the foregoing suggestions imparts an advisory rather than a mandatory character. If effective results are to be achieved the authority's edicts must be made compulsory. Indeed, the tasks to be undertaken are in the aggregate so great that their accomplishment can never be adequately achieved until the whole business of London transport above and below ground becomes one of public ownership as a department of the Ministry of Transport. One of the weakest aspects of the report is the dogmatic manner in which the document asserts that "while some increases of fares are inevitable, these are now in some cases too high; while the general financial policy which renders them necessary is open to question." That assertion cannot be sustained in face of the fact that in America as well as in this country the rise has been general in order to meet the higher costs of labour and materials. If that has happened in a country where the raw products are obtainable within its own borders, how much greater must be the justification in this country which has now to compete with imports from the United States of coal and rails, notwithstanding that in the United Kingdom both steel and coal are in receipt of State aid. With the additional charge of six shillings a ton on coal, it will not be surprising if further revision becomes necessary. As to omnibus fares, the Committee's criticism is not justified in face of the report presented by Sir Arthur Whinney, the accountant who was appointed by the Home Office to investigate the increases, and who, after an examination of the books, declares that the company's action was fully justified. The best course for the Government to pursue would be to appoint expert representatives of all the interests to draw up a scheme for a Traffic Authority, and when their scheme has been approved to depute to them the task of giving effect to it. Financial considerations have received little attention in the report of the Committee, although they must have great influence in any scheme that may be adopted.

MUNICIPAL TRAMWAYS ASSOCIATION.

ANNUAL CONFERENCE.

The annual conference of the Municipal Tramways Association will be held at Dundee on September 17, 18, and 19. The headquarters will be at the Royal Hotel, and the meetings will take place in the Town Hall. Mr. T. B. Goodyer (general manager of Croydon Corporation Tramways), president for the year, will take the chair, and a large attendance is expected. In 1917 Mr. Peter Fisher, general manager of Dundee Corporation Tramways, occupied the president's chair, but in view of the exigencies of the time, it was considered desirable that the conference should be limited to a strictly business programme and should meet in London. It was then arranged, however, that after the war the Association would hold an annual conference at Dundee, and the Council, with the approval of the president, has taken the first opportunity of fulfilling the promise then made to the representatives from Dundee.

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Tramways and Light Railways Association.

Annual Conference held in London, July 25, 1919.

TRAMWAY FARES AND SERVICES. :: :: :: POST-WAR PROBLEMS.

The annual meeting and conference of the Tramways and Light Railways Association was held on Friday, July 25, at Caxton Hall, Westminster, S.W., Mr. R. J. Howley (vice-chairman of the Council) presiding.

Mr. Howley expressed regret at the enforced absence of the chairman, the Hon. Sir Arthur Stanley, M.P., who was compelled to attend the King's garden party that day at Buckingham Palace, but would be at the dinner in the evening.

The Secretary (Mr. A. de Turckheim) having read the notice convening the meeting, the statement of accounts and balance sheet were confirmed.

The following statement by the chairman was then read.

THE CHAIRMAN'S STATEMENT.

Before putting the resolution to the meeting, approving the accounts, you will wish me to say a few words with reference to the work done by the Association during the year under review. Before doing so I wish to congratulate you all on the fact that we are meeting to-day under conditions of peace. When we met last year on July 12 the outlook was still very serious and no man could tell how long the war would last. Fortunately that nightmare is removed, though we still have difficult times to face before matters become normal.

Then I wish to say a few words with regard to the losses we have sustained in the persons of two of our old friends, both vice-presidents of this Association, Mr. Stephen Sellon and Mr. William Murphy. Your Council passed the customary votes of condolence with the relations of these two members, but I think it is fitting to refer to the matter again at this annual meeting, which was regularly attended by Mr. Sellon, who invariably took part in our discussions. The Association has lost two very good friends and we all deeply deplore their loss.

We will now review the activities of the Association during the last year. The outstanding feature undoubtedly was the question of labour and wages. From January to November we had practically uninterrupted series of meetings and negotiations with the representatives of the employees. For the first time the Unions put forward demands in the form of national demands; after consultation with our friends of the Municipal Tramways Association and at the request of the Ministry of Labour we agreed to meet them on this basis. There were four applications to the Committee on Production and four awards were given.

The first award in March, 1918, gave to the men 20s. war bonus. In July a claim for an increase of 12½ per cent. on total earnings resulted in a further award of 5s. per week; in August a claim by the Unions that this should apply to women was successful, and in November a further claim for 10s. per week resulted in an award giving them 5s., and bringing the total war bonus up to 30s. per week.

Since our Association is not a Trade Union, able to bind its members, it became necessary to set up a separate body under the auspices of the Association which would be capable of dealing with questions of labour and wages affecting company undertakings.

Our company representatives were called together at frequent intervals and finally "The Conference of Tramway and Light Railways Companies" was set up, with an Executive Committee to whom these matters are now referred. The Municipal Tramways Association have a somewhat similar organisation. The outstanding work done by this joint conference was the settlement of the famous Terms of Agreement of March 20, 1919, with which you are very familiar. This agreement, setting up a 48 hours week, was conditional upon our being given general powers to raise fares. Representations were made to the Ministry of Labour and to the Board of Trade without, I am sorry to say, any satisfactory results being obtained. The matter is still under consideration.

This brings me to the question of the National Joint Industrial Council, which is destined to become the body to deal with these matters in the future. A great many meetings and conferences were held; a constitution was drafted and was subsequently approved by all parties for setting up this Council which is to consist of 44 members; 22 representatives of the employers and 22 representatives of the employees. The 22 'employers' representatives are to be divided into 14 representatives of municipal and 8 representatives of company undertakings. You will remember that our eight representatives were elected by ballot. They will serve for one year, and you will perhaps like me to give you their names; they are:—A. H. Beatty, E. H. Edwardes, R. J. Howley, C. G. Tegetmeier, W. G. Bond, H. England, C. J. Spencer, W. G. Verdon-Smith. Once the Joint Industrial Council is set up the Association will be at greater liberty to take up what I may call its more legitimate functions, that is, to deal with problems of a technical nature. There is much to be done in the way of reconstruction, and I hope the Association will be able to resume its pre-war work in setting up committees of experts to deal with pressing questions as they arise.

The Vice-chairman then proposed the re-election of the members of the Council, Mr. A. L. C. Fell seconded, and the motion was agreed to.

On the motion of **Mr. H. P. Conibear,** seconded by **Mr. W. Thom,** the auditors were re-elected.

On the motion of **Mr. Verdon-Smith,** a vote of thanks was passed to the chairman for his assiduous attention to the affairs of the Association during a very strenuous year. The business meeting was then concluded.

The conference was opened by **Mr. R. J. Howley,** who took the chair, and introduced **Mr. Madgen,** who gave a brief summary of his paper, of which the full text is given below.

NOTES ON TRAMWAY FARES AND SERVICES.

By Wm. L. Madgen, M.I.E.E.

There are two criticisms which apply generally to tramways in the United Kingdom. The first of these is: That they fail to produce an adequate financial return to their proprietors; the second is: That in many respects they fail to give the community all the benefits of which they are capable. As a matter of plain fact, we have here a simple example of cause and effect—of what happens when a community is working a strangle-hold on an industry.

Both these criticisms apply in greater or lesser measure alike to the tramways owned by municipalities and to those owned by companies, and to a large extent these failures are the result of faulty legislation. This legislative handicap weighs with different force upon company and municipal tramways, but both are affected, and the remedies have not so far been within the power of any body but Parliament itself. The immediate object of this paper is to point out some ways in which it appears to the writer that the controlling bodies have a considerable responsibility for the failures mentioned, and have it within their power to bring about better results.

The first point is that tramways do not produce an adequate financial return to their owners. It is taken first for the reason that an insufficiently remunerated industry cannot provide the community with the full service of which it is capable under more encouraging conditions.

A prosperous industry can accumulate funds available for the improvement and extension of its activities or can attract the necessary capital for such purposes. A starved industry cannot do this. Municipal corporations can no doubt obtain loans upon favourable terms because they offer to investors the security of the rates, but they are naturally loth to increase municipal indebtedness for the extension of services which are not likely to be remunerative unless such services are obligatory. Tramway companies cannot obtain capital for extensions unless they can show that their existing enterprise is giving a reasonable return.

The effect of an industry being starved is felt in many other ways. The management and all in responsible positions are always conscious of a pinched feeling, deadening to enterprise and making them averse to trying changes which they know will have a temporarily adverse effect on the net receipts, although they believe that they would eventually give good results. This is particularly true of changes, the effect of which depends upon the education of the public, a process which inevitably takes time. But it is not only the management and those in the more responsible positions who feel the pinch; it reacts on all employees. In the long run it is impossible for a harassed and despondent industry to make its conditions of service as attractive as those of a healthy and prosperous one. Some of the directions in which tramways have failed to achieve their possibilities involve improvements which may take some years to become remunerative. It is not to be expected that a starved undertaking can venture on these.

It has to be noted that whilst a number of the municipal tramway systems show good financial returns they are none the less starved

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because the bulk of their net receipts are ruthlessly appropriated in aid of the rates, instead of being utilised in the improvement of the service. This point was well taken by Mr. McElroy in his report on the Manchester tramways, wherein he showed that the whole of the extensive improvements recommended could be financed from the tramway net receipts if the City Council would refrain from appropriating £100,000 per annum for the benefit of the borough fund.

Apart from this unjustifiable diversion of tramway profits where they exist, which is not under the direct control of the managing bodies, it remains to inquire why tramways are not more prosperous and therefore more useful to the communities which they serve.

It is clear that for a service to be remunerative the sums charged for it must cover the whole of the costs, including capital charges, and provide a reasonable margin. It is also clear that the charges made for the service ought to be equitable, i.e., every passenger should pay his fair share of each of the items of cost involved in carrying him. In transport undertakings some of these items of the cost of service are proportional to the distance a passenger is carried. Some of them are more nearly represented by a fixed amount per passenger. If, therefore, we can ascertain what these costs amount to per passenger in any given case, the result gives a sum which must be exceeded by the fares charged for the shortest journey. The fares for longer journeys should be increased over this minimum in proportion to the distances.

The results of such a scheme of fares are, first, that every passenger pays his fair share; secondly, that the longer journeys are relatively cheaper than the shorter ones; and, thirdly, that the travelling expenses consequent upon living at a greater distance from the place of employment are less than proportional to the greater distance. The last-named effect would be of immense importance in making tramways of greater service to the community.

Taking "standing charges" to include all the costs of having the system equipped and ready to meet the traffic, and the "running costs" as those proportional to the passenger miles, we distinguish a figure for standing charges which can, with entire fairness, be spread equally over the whole number of passengers. The equity of this, as regards passengers at the minimum fares, is made more apparent by the fact that, taking all the tramway systems collectively, a far larger number of passengers are carried at minimum fares than at any others. This is true for at least the majority of individual systems. For the tramways of the whole kingdom the Board of Trade's return for the year 1913-14 show that the average receipts per passenger were 1·105d., proving that the number of passengers at one penny (the minimum fare on the majority of systems) is far in excess of those at higher fares. As an example of a particular system, Glasgow may be cited where the minimum fare of one halfpenny was paid in the year 1918-19 by 63 per cent. of the total number of passengers.

The following figures represent a reasonable division of tramway costs into a fixed charge per passenger and charges proportional to the length of journey. They are extracted from the last published Board of Trade returns, viz., for the year 1913-14. They represent pre-war costs, and require considerable modification to make them fit present conditions. There is not sufficient data available for a safe estimate covering stable post-war costs of labour and material, but this does not affect the principle, and it is better to use figures representing facts under known conditions than to make alterations dependent upon guess work.

ANALYSIS OF TRAMWAY EXPENSES EXTRACTED FROM THE BOARD OF TRADE RETURNS FOR THE YEAR 1913-14.

	Total.	Standing Charges.		Running Costs.	
	£	%	£	%	£
Depreciation, say 4 per cent. of capital ...	3,239,113	100	3,239,113	nil	—
Expenditure interest at 3·03 per cent. ...	2,389,208	100	2,389,208	nil	—
Permanent way ...	815,561	50	407,781	50	407,780
Electrical equipment	171,114	80	136,891	20	34,223
Engines, etc.	20,628	nil	—	100	20,628
Rolling stock	1,177,431	nil	—	100	1,177,431
Building tools, etc. ...	125,769	80	100,615	20	25,154
Traction power ...	2,137,361	nil	—	100	2,137,361
Traffic expenses ...	4,236,026	5	211,801	95	4,024,225
Rent of offices, etc. ...	50,064	100	50,064	nil	—
Rates and taxes ...	638,537	100	638,537	nil	—
Compensation and insurance	235,971	20	47,194	80	188,777
Other expenses ...	551,094	100	551,094	nil	—
	15,787,877		7,772,298		8,015,579
Average per passenger	1·105d.		0·544d.		0·561d.

It has to be observed that these figures are an allocation of the total receipts, the two first items, "depreciation" and "interest," being an allocation of the net receipts of £5,628,321 deduced from the returns.

The operating figures given in the return are as follows:—

Passengers carried	3,426,473,192
Car miles	354,379,672
Gross receipts	£15,787,877
Working expenses	£10,159,556
Net receipts	£5,628,321
Capital expenditure	£80,977,838

The gross profits amount to 7·03 per cent. of the capital expenditure. Allowing 4 per cent. for depreciation, the average net yield on the capital invested was only 3·03 per cent.

This result proves that the tramway work in the United Kingdom is a starved industry, for a return of 3·03 per cent. is not sufficient to attract capital or to justify its expenditure, nor does it provide a margin for enterprise in improvements and extensions.

The figures show that the average receipts per passenger were 1·105d., of which standing charges absorbed 0·544d. and the running costs 0·561d. From this it follows that the basic or fixed charge per passenger to which running expenses proportional to the length of journey have to be added should exceed ·544d. at pre-war rates, or, in other words, that in 1913-14 every passenger carried should have paid ·544d. plus an amount varied according to the distance travelled. This fare would, however, have provided a yield of only 3·03 per cent. on the capital, which, of course, is quite insufficient.

A moderate yield is 6 per cent., amounting to 0·340d. per passenger. Taking the depreciation, etc., at 4 per cent., as before, gives 0·227d. per passenger; rent, rates, etc., as before, gives 0·090d. per passenger; and taking 100 per cent. increase over pre-war prices for the items mainly made up of labour and material belonging to this side of the account, gives 0·120d. per passenger, making a total of 0·777d. as the basic figure for standing charges, to which must be added in each case an amount per mile travelled to cover running costs.

In tabular form, standing charges modified from 1913-14 Board of Trade returns to give a yield of 6 per cent. on capital and 100 per cent. increase on items affected by post-war prices:—

	Total.	Per passenger.
Depreciation, 4 per cent. ...	£3,239,113	0·227d.
Interest, 6 per cent.	4,858,640	0·340
Rent, rates, taxes, etc. ...	1,286,889	0·090
Material and labour items ...	1,714,176	0·120
	£11,098,818	0·777

It has to be observed that, taking the figures of depreciation and those for rents, rates, taxes, etc., from the 1913-14 returns unaltered, is an assumption too favourable to the passenger. As depreciation has to provide for replacement of equipment, it will be increased by the rise which has taken place in labour and materials. Taxation is also unlikely to revert to pre-war levels in any near future, so that this basic figure of 0·777d. per passenger is rather on the low side, and leaves something to be made up by the passenger mile charge for depreciation and return on capital, and meets the criticism that a portion of these charges is in fairness proportional to the use made of the system by each passenger.

There are no statistics in the Board of Trade returns or the accounts published by tramway undertakings of the passenger miles, so that the running expenses per passenger mile can only be estimated. A fair estimate of the average distance each passenger was carried in 1913-14 for the average fare of 1·105d. is two miles, or a total of 6,853 million passenger miles for running costs of £8,015,579, or 0·281d. per passenger mile. At post-war prices of labour and material, this cost will be doubled, but let us take it on the low side at 0·55d. per mile.

On the bases set out then a table of fares against distance would give the following figures:—

	Standing Charges.	Running Cost.	Total.	Rate per mile.
For 1 mile ...	·77d.	·55d.	1·32d.	1·32d.
,, 2 miles ...	·77d.	1·10d.	1·87d.	·935d.
,, 3 ,, ...	·77d.	1·65d.	2·42d.	·806d.
,, 4 ,, ...	·77d.	2·20d.	2·97d.	·742d.
,, 5 ,, ...	·77d.	2·75d.	3·52d.	·704d.

This table is an illustration of the plan on which an equitable fares table can be made up. It is believed to give fair average figures for United Kingdom tramways under post-war conditions, but each undertaking can determine the two basic figures—standing charges and mileage rate—from an analysis of its own accounts. Greater London is, of course, a particular case in which special factors have to be considered.

It is submitted that this is a sound method of settling fares, and that it will tend to raise the tramway industry, legislation permitting, from the position of being starved to one in which it will be moderately prosperous, and therefore able to attract and to expend capital in improvements and extensions. Such a result will meet the first criticism mentioned at the beginning of this paper, viz., that

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tramways fail to produce an adequate financial return to their proprietors, and will enable them to meet the second criticism, viz., that in many respects they fail to give the community the benefits of which they are capable.

Of the failures to benefit the community as much as they should, by far the most important is that tramways have not brought about that spreading of the population of large and crowded industrial centres which they clearly can assist. It is admitted that they have done something in this way, but, on the other hand, it is believed that the practice of giving very low fares for short distances, which militates against reasonable financial returns, has another very serious effect, in that it encourages people to continue to live at distances from their work within the radius of the minimum fares. The table of fares given above shows that on a sound basis the fare per mile would be lower for long distances than for short ones. That is, a man living two miles from his work would not pay twice as much in tramway fares as one living a mile away.

Supposing that 500 journeys are made per annum, the expenditure on tramway fares for different distances will be as follows: —

Distance.	Annual cost of 500 journeys.
1 mile	£2 15 0
2 miles	£3 17 11
3 ,, ...	£5 0 10
4 ,, ...	£6 3 9
5 ,, ...	£7 6 8

Or, whilst it would cost a man on this basis £2 15s. 0d. per annum to live a mile away from his work, each additional mile would cost him only £1 2s. 11d. per annum more; £2 15s. 0d. per annum is 1s. 0¾d., and £1 2s. 11d. is 5¼d. per week, very closely.

It is obvious that successive rings at distances of one mile, two miles, etc., from a given centre have areas proportional to their distance. Taking the rings as a mile wide, that lying between one and two miles radial distance will have an area of nearly 9½ square miles, or 6,030 acres; that between two and three miles an area of 15¾ square miles nearly, or 10,050 acres; and that between three and four miles an area of nearly 22 square miles, or 14,070 acres; and that between four and five miles an area of 28¼ square miles, or 18,090 acres. With these increases of living room it is at least probable that rents will decrease with increasing distance from the centre more rapidly than the annual expenditure on fares increases. There will be more room to live, more garden and park space, more sunlight and fresher air.

The importance of providing the poorer classes with these improvements in their living conditions is so well understood that it is unnecessary to dwell on it, but it has not been sufficiently recognised that a rapid and economical means of travelling over the greater distances between house and work is essential to the purpose, and that it is best afforded by tramways up to at least six or seven miles from the industrial centres.

The most serious social fault of the systems of very low fares for short distances is that they discourage families from moving outwards. It is at least partly due to this effect of low fares that the central districts of some of our large cities, such as Glasgow, have not been relieved of their overcrowded slums to anything like the extent which might have been expected from the operation of the very efficient tramways there. As above explained, this low-fare system charges the short-distance passenger less and the long-distance passenger more than his fair share of the standing charges, and is therefore a direct handicap upon the spreading of the overcrowded population. It is not because Glasgow has not made tramway extensions to long distances from the centre. It has done so in a few directions, but only seven of these spurs go beyond three miles from the central districts. Similar conditions as to fares and extensions prevail around other crowded centres, and the only reasons for mentioning Glasgow are that the Corporation has made a special feature of halfpenny fares, keeping them in operation throughout the war, and that 14 per cent. of the population are reputed to live in one-roomed "houses." If the Corporation had perceived the relation of tramway fares to overcrowding, there can be little doubt that it would have arranged them to encourage the spreading of the population rather than to discourage it.

Most of us are familiar with the consideration which I might mention here that the crowding up of cars by minimun fare passengers has a tendency to drive away those wishing to travel longer distances and to encourage competitive services.

There are two obvious difficulties against setting up a rational fare system. The first is that tramway fares are generally limited to a maximum of one penny per mile, and any sound system—at present costs—must charge more than a penny for the first mile. Besides this general statutory obstacle, there are numerous provisions in special Acts and Orders, agreements between companies and local authorities, and the like, setting out scales of fares or maximum fares which cannot be reconciled with the principles laid down.

An entirely different set of circumstances has also had a serious influence upon the development of improved transport facilities by means of tramways and light railways.

The rateable value of a town is in some degree a measure of the remuneration paid to some of its principal officials and of the personal prosperity of the trading classes, of which with a sprinkling of professional men the Council itself is largely composed. Now we must not regard these gentlemen as municipal Pharaohs who consciously and intentionally "will not let the people go," nor can we believe that they impose bad fare systems upon the tramways in order to keep the population within range for business purposes or to promote congestion; but we may urge that the community should be no longer subject to the "rateable value" fetish which tends to provide particular attractions for the centres of population and an influence adverse to the provision of adequate housing arrangements in more healthy surroundings.

The working classes have been misled into the idea that the halfpenny tram fare is an advantage to them, but as a cold and cruel fact the conditions which it helps to foster are the very worst in all respects for themselves and their children. There is very strong evidence that the contrast between the sheer discomfort of the crowded working class quarters and the comfortable homes of those who are able to live in decency and comfort—though they may derive their incomes from the same industries as the workmen—is a chronic and growing cause of the unfortunate spirit which manifests itself in labour unrest. Of the many manifestations of this spirit during the war, it was noticeable that the worst and most persistent cases occurred precisely in those districts where overcrowding is most prevalent.

What labour needs above all things is to improve its living conditions, and one of the most effective means to that end is to spread the houses outside the industrial areas in bright and pleasant surroundings, where the working man and his family can enjoy their allotments or other favoured occupations of their increased daylight hours and leisure time. To make this possible the lowest possible fares for the longer distances, and ample transport facilities for those districts are essential. Both these conditions will be favoured by abolishing non-paying short distance fares, graduating all fares in an equitable way, and making the tramways sufficiently remunerative to induce an enterprising spirit in the management.

Much could be done in many cases to improve the travelling facilities by connecting up neighbouring tramways and instituting through running. There are many cases where the use of tramways has been greatly increased by such arrangements, clearly showing that adjacent but separate tramways do not serve the best interests of the public.

It is obvious, therefore, that a campaign of education and propaganda among the authorities concerned in favour of sound fare tables and a more tolerant spirit is urgently necessary, and the tramway interests should take up this work with energy.

The fact already mentioned that the system of fares advocated will raise the fare above the statutory limit of one penny per mile for the first mile indicates that the Government and Parliament may have to take action, and will therefore require some instruction. But it may be pointed out that the present Government proposes to include in the powers of the Ministry of Ways and Communications that of regulating tramway fares among others, so that if the Bill becomes law in that respect, the desired alteration will be by administrative action. At any rate, the industry will know what door to knock at, and with such a good case in the interests of all concerned it should not be so very difficult to ameliorate the conditions.

There is another difficulty about the application of rational ideas to tables of fares, viz., the coinage.

The table already set out gives the following figure for distances from one to five miles: —

Distance.	Fares.	Nearest coin value.
1 mile	1·32d.	1¼d.
2 miles	1·87d.	1¾ or 2d.
3 ,, ...	2·42d.	2½d.
4 ,, ...	2·97d.	3d.
5 ,, ...	3·52d.	3½d.

For the first two miles the nearest coins include farthings, and, even so, the difference between the theoretical fare and the nearest coin is a somewhat large percentage of the total. Farthings are not popular. An attempt to rationalise tramway fares by the use of them was made some years ago on a number of systems, and after patient trial was withdrawn.

The penny has too small a value for the minimum fare, because the standing charges item alone is nearly ·8d., and the length of ride which could be given for the ·2d. balance is too small for a stage. Therefore the minimum fare must exceed one penny, and it should be a single coin. The writer strongly advocates the adoption of the decimal system of coinage as approved by the Associated Chamber of Commerce, the Institute of Bankers, the Decimal Association, and by numerous other bodies, including your Association. This system divides the £1 into 1,000 mils, and includes the provision of a 5 mil nickel coin of the value of ten to the shilling. This is equivalent to 1·2d., and would suit a rational system of fares very well. The value is a little lower for the mile distance as set out above, but that table is only an illustration based on collective figures. The actual

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length of the stages will in every case have to be adjusted to the circumstances and costs of the particular system. There is no need to keep to even miles in making this adjustment. As it is, the lengths of fare stages are rarely based on even miles. They vary on different routes on the same system as the stages are in practice defined by traffic points, junctions, etc. There is no more difficulty in fitting the stages to the coins of a decimal system than to the halfpennies and pennies now in use. Five mils is a better starting point than a penny or the nearly equivalent four mils, and there are very strong reasons in other directions for making the coin, which has probably the greatest use in retail transactions, of the slightly higher value.

The rational adjustment of fares which will put tramways on a sound financial basis, and enable them to play the part they should in improving social conditions will be, in the author's opinion, greatly facilitated by the introduction of a decimal system of coinage.

There is not time to say much on the question of services. The author believes that the power of the tramway to give frequent service is not perhaps so generally recognised or utilised so fully as we may hope it will be under more encouraging conditions. Frequency of service has an extraordinary power of developing traffic. The aim of the tramway manager is to run every car mile on every route which will pick up anything in excess of its standing charges and bare cost of running. This object cannot be attained by calculating from the number of people served and the minimum service which can suffice them. To attain the object calls for a continuous study of the habits and tendencies of the population, their working hours, shopping hours, and places and times of recreation, entertainment, and any other factors tending to induce them to travel. This means adapting not merely the daily normal service, but adding more cars at suitable hours in accordance with the local circumstances. The formation of the travelling habit in the people living along any route, and the attraction to living on that route of people who have the travelling habit or travelling needs is fostered by the appeal of a good service more effectively than by any other means. It is clearly better to have a car making only a small net revenue per mile than to be standing idle in the shed.

An enterprising manager will keep his services rather a little better than apparent necessities than a little below them. Experience shows that this policy pays. In some instances a route which has not paid during the dull hours of the day with a poor service has responded so well to a more frequent service during those hours that it has paid continuously.

The author ventures to impress on members of the Association the opportuneness of the present time for a vigorous propaganda in favour of the objects set out, and will conclude by summarising as follows :—

(1) Tramways are not so successful financially as they should be, and for that reason not able to do all that they might for the communities they serve.

(2) One reason for the lack of financial success is that fares are not graded so that every passenger pays his fair share of standing charges as well as the cost of carrying him ; the fares chiefly in default are the short distance fares.

(3) Generally, the minimum fare should be rather over one penny, because the standing charges alone approach closely to that amount. Rational grading will cheapen long journeys and encourage that spreading of population and relief of congestion which is one of the principal social advances to which tramways can contribute, and at the same time give them the necessary financial strength to make the extensions and improvements needed.

(4) The opposition to increase of the lowest fares is partly ascribable to shortsightedness on the part of the authorities concerned. It should be combatted by an educational propaganda wherever it exists.

(5) Rational grading of fares will be greatly assisted by the adoption of decimal coinage with a 5 mil piece (1·2d.) as the practical unit for small transactions.

(6) Frequent service is the best educating influence towards the formation of the riding habit among the public.

I desire to express my acknowledgment and thanks to Mr. A. W. A. Chivers and to Mr. H. M. Sayers for their collaboration in the preparation of the data submitted in this paper.

DISCUSSION.

The Chairman described the paper as a very interesting one, and invited Mr. Spencer to open the discussion, as he believed that gentleman had been through the mill lately in London.

Mr. C. J. Spencer (manager, London and Suburban Traction Company, Limited, observed that he was not the only tramway man who been through the mill. He believed Mr. Fell had had a similar experience. At the outset, he wished to say that Mr. Madgen's brief summary that afternoon gave them a very poor idea of the excellence of the paper which he had had the advantage of perusing. During the last few years he had read many papers presented to Associations such as theirs, and he could not say he had ever read a better one than that now before them. It dealt with points of great interest and he rather regretted Mr. Madgen had treated the matters so shortly. It would have been a great advantage if the figures and arguments had been extended and discussed, and he hoped as the conference proceeded some members would bring out those points which Mr. Madgen in his modesty had omitted. The first point was a double one, which had received too little consideration from tramway operators, viz., that costs may be and should be allocated under two headings—standing charges and running costs. Mr. Madgen stated that at any rate every passenger should first of all pay something down to represent the standing charges. This simply meant that every passenger who stepped on to a car, even though he only rode a few yards and stepped off again, should be in the position of having paid his standing charges although he might only have incurred a small proportion of the running costs. Under Mr. Madgen's calculations it appeared that that something was three-quarters of a penny, representing standing charges alone. Under present circumstances he was inclined to think it was considerably higher, and that the author of the paper was rather too moderate in his views as to what the standing charges really are. At any rate, taking them at three-farthings, it did mean that a halfpenny fare was uneconomical and unsound, and that it could not under present circumstances be adopted with anything like safety. Mr. Dalrymple, who was present, had had large experience of halfpenny fares, and it was to be hoped he would contribute to the discussion. Mr. Madgen argued that what was of great importance was that they should first get from the passenger his standing charges, and add a reasonable amount for running costs. That meant really that no passenger should be carried even for a penny, and that the basis of a minimum fare chargeable to a passenger is more than a penny. He thought to-day that was an absolutely sound proposition. When in Bradford he had to face, like most people, the problem of how to extend a stationary income. They took advantage of the powers they had to enforce a minimum fare of 1½d.; they could have enforced 2d., but compromised and took the 1½d. That step immediately lifted the undertaking out of the financial morass in which it found itself, and he believed that was the only sound and proper way of dealing with the position. Simply shortening the stages as was done in London and other places was not sufficient. Let them remember that when a stage was shortened they placed the burden unequally upon the shoulders of the passengers. A very considerable proportion, probably from 50 to 60 per cent., paid no increase at all. They had been in the habit of riding a mile or less and the shortening of the stage to that distance did not affect them, so that a very big proportion of the passengers got off scot free. On the other hand, the long distance passenger had to pay 100 per cent. or something more and he naturally kicked, and kicked very hard. According to Mr. Madgen, and he believed the argument was sound, the long distance passenger should be carried cheaper and not dearer, but under the plan of shortening stages the reverse took place. If they made the minimum fare 2d., instead of 1d., they gave practically everything the public had a right to ask. In his view, they could not continue to operate tramways successfully at the present rates. The last few months in London had been good months from a revenue point of view, but there was good reason to believe those months were abnormal. Tramways were faced with rising expenditure, and they were also faced with other difficulties ahead. Prior to the war most undertakings considered that if they put on one side 1d. per car mile for renewals of track they were dealing with the matter in a rational way. But to-day that provision was totally inadequate and it should be at least doubled to meet present prices. Unless tramways obtained more revenue the outlook was serious. On the other hand, he was not sure that they as tramway operators had always done what they might have done. They would have to think on more scientific lines in future in managing an undertaking, and he hoped the discussion on Mr. England's paper would give an opportunity for explaining their views on that side. He could see little or nothing in Mr. Madgen's paper to which he could take exception. The paper was sound, and might very well be used as a text book in the alteration of the present position. He heartily concurred in the suggestion that the right way was to start public propaganda. The public did not understand, and until the public understand the Government would never understand. He believed the right method was to have full publicity. The cause was financial. Transport, railways, and tramways were vital to the life of this nation, and it was against national interest that anything should happen which would land the transport undertakings in a condition of extreme poverty in which they could only give the poorest services.

Mr. A. L. C. Fell (general manager, London County Council Tramways) regretted that as he had received the paper that morning he had not had time to study it properly, or to do it any justice in making a few remarks. Like his brother criminal, Mr. Spencer, he had just been through the mill at the House of Commons, and probably learnt a good deal there about fare adjustment and other matters. He could only say that he felt they were treated much more like criminals than tramway managers, and certainly it was not their fault that they were treated in that manner. He quite failed to see why a newspaper should be allowed to charge 100 per cent. increase for its issue each morning and a tramway undertaking be opposed up hill and down dale if it attempted to increase its fares by 33 per cent. Of course, they simply had to meet the abnormal conditions of the times. Personally, he was a great believer in

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charging the lowest possible fare for passengers on a tramway system in order to encourage the traffic. He was specially a believer in giving long-distance passengers a cheap fare—even give him a workman's fare—because he thought if they encouraged the long-distance passengers—fathers of families—to settle down in an outlying locality, the members of the families gave them short-distance fares. Therefore, what they lost on the one hand they gained on the other, making it up on the family, so that although the father did not pay what he should, it might be an advantage to the tramways to carry him at a loss. In London they had on the tramways the most extraordinary burdens, and he thought they would have to see if they could not get relief from some of those burdens at any rate. Tramway undertakings in the metropolitan area—some company undertakings as well as municipal undertakings—had been swamped in that way. He knew this because the L.C.C. had to purchase the undertakings, and incidentally had to pay for the improvements which were arranged for when the tramways were constructed. But it was a most unfair thing that a tramway undertaking which used the street should have to bear the whole cost, or a great proportion of the cost, of the street improvements, when every other vehicle was allowed to use that street free of cost. They would see that even that great body the London County Council contributed enormous sums towards the widening of the streets like the Strand, Piccadilly, and everywhere else omnibuses and other vehicles use the streets and yet do not have to pay one penny towards the cost of those street improvements. Whereas if undertakers dare to put a tramway in a street, they are charged with the cost of improving the street, and find after building the tramway, reconstructing the road, and remaking the paving, that a competing service is put on against them. He thought all that was a great shame. Then they also had the great burden of rates on the permanent way of the tramways, and that matter ought certainly to be considered by Parliament. It clearly ought to be remedied, for many tramway undertakings were simply swamped by all these burdens of rates, etc. Of course, they also had the track maintenance to look after. They were called on to maintain the paving of half the street, which they did not wear out. Besides all those burdens which were handed down to them from the distant ages when tramways were first put into operation and worked by horse traction, they had the extraordinary labour charges. They also had the burden of peace which was thrown on to them by various agreements with the Transport Workers' Federation. For example, what was the result on the previous Saturday, when they thought they were really going to have a good day on the tramway system? The result was that they took something like £14,000—a most disappointing day—and they spent something like £18,000 on wages alone. So it was hardly an occasion for tramway owners to rejoice. Those were the sort of conditions under which the public expected tramways to be run to-day. They freely voted this, that, and the other, so that the workmen shall get their share of the profits of the undertaking—and rightly so, for he thought they should get a reasonable return out of the profits of the undertaking—but he thought they should be quite sure that there were some profits before they proceeded to take pailsfull of money out of the undertaking. He thought that the tramways of this country had reached saturation point, and unless they obtained some relief there was no alternative to many of the undertakings having to come to an end; and then they would have to invent some other means of locomotion, because no tramway could exist at all unless it became a rate-aided institution run for the benefit of the public without any responsibility of giving a fair return. He feared that unless our rulers are extremely careful that was the direction in which they would be tending at the present time. He hoped tramway authorities throughout the country would carefully consider the matter before giving anything further away which would bear hardly on the tramway industry.

The Chairman remarked that they had all heard much about the cheap fares in Glasgow, and he invited Mr. Dalrymple to give the conference the benefit of his experience there.

Mr. J. Dalrymple (general manager, Glasgow Corporation Tramways) said he noticed Mr. Madgen referred to him as being one of the chief supporters of ½d. fares. He had only received Mr. Madgen's paper a few minutes ago, and had not been able to read it. He took it that Mr. Madgen's view was that tramway passengers should be carried at the lowest possible fare which would meet all expenses, and give a reasonable return on the capital invested. This was his own view. In Glasgow there were still ½d. fares, and, last year, over 6.4 per cent. of the passengers paid this fare. That meant, of course, that the average revenue per passenger was extremely low. For some years it had been about ¾d. Several years ago, when the Corporation decided to double the ½d. stage, he endeavoured to show that it would be a mistake to give the ½d. passenger too good value, because it took more than ½d. to put the car on the street, without taking into account any working expenses. The Glasgow people, however, thought otherwise, and they extended the distance which a passenger could ride for ½d. from a little over half a mile to considerably over a mile. This is the distance which ½d. passengers can ride in Glasgow to-day. The result of that change was rather remarkable. We not only made up the deficiency which was caused by 1d. passengers being transferred to the ½d. rate, but we carried so many more people at ½d. that we had a greater revenue than before the change. Of course, the cost was somewhat higher, as it took more cars and a larger staff. At that time the cars were overcrowded, and we were only carrying an average of 11 or 12 passengers per car-mile, whereas we are now actually carrying almost 20 per car-mile. Under these circumstances it was very difficult indeed to persuade the travelling public that there was any need whatever for an increase in the fares. Of course, if the conditions had been to-day the same as they were in pre-war days, they never would have dreamt of proposing an increase of fares in Glasgow; indeed, there would never have been any occasion to suggest an increase. It was stated that to-day tramways undertakings could get an increased fare if they could show that their position was worse than it was in 1914. Very few undertakings, however, could show that they were in a worse position financially than they were in 1914, so that they had considerable difficulty in making out a case for an increase in fares. He was not so anxious about the position to-day as he was about the position in which tramways undertakings would be in two or three years hence, when people would, very possibly, have less money to spend on tramway fares, and when, possibly, their expenses would not be much less than they were to-day. Then, undoubtedly, would be the time when every one of the undertakings would require a larger fare to meet their expenditure, and it would then become a question whether they would be able, with their increased fare, to get the necessary increased revenue, because they all knew that an increased fare did not always mean an increased revenue. In Glasgow every reduction in the fares that had taken place had resulted in an increased gross revenue. The present fare had enabled them not only to carry on the undertaking, and to keep it up in a thoroughly satisfactory condition, but to wipe off the whole indebtedness. At the present moment, however, notwithstanding the fact that their whole indebtedness had been wiped off, they had, last year, only a balance of £14,000 to hand over to the Common Good, without having charged a single penny for interest, or having any sinking fund to meet. He had suggested to the Corporation that they should now have an increased fare, not so much to meet the immediate conditions, but to keep them in the position that they had always been in of having sufficient money to keep the undertaking thoroughly up to date. If they were not, in the years to come, able to keep the undertaking in a thoroughly efficient condition they all knew what the result would be. He was very glad to be able to be with them that day, and would read Mr. Madgen's paper with a great deal of interest.

A Member asked Mr. Dalrymple for his view on the question whether or not the low fares in Glasgow had had the effect of restraining the spreading of the population to the outskirts.

Mr. Dalrymple replied that of course the congested population in Glasgow was there before the tramways existed. He could not say how far the low fares had aggravated the congestion. It might be that low fares had caused people to remain near the centre who might otherwise have lived in the outskirts; in Glasgow the head of the household very frequently lived at a considerable distance from his work, but the members of the family got the advantage of the low fares as they could travel home for their dinner in the middle of the day. When the ½d. fares was extended to cover over a mile, the volume of mid-day traffic increased enormously. This was caused undoubtedly by young people going home for dinner who previously took a "snack" in the city.

The Member asked how many times the population of Glasgow travelled.

Mr. Dalrymple replied that the population of Glasgow was greatly over 1,000,000, and that, last year, the tramways carried over 464,000,000 passengers; of this number, 290,000,000 were ½d. passengers.

Mr. C. D. Stanley (engineer and manager, New St. Helens and District Tramways Company, Limited) said another point arising out of Mr. Dalrymple's remarks on the paper was whether a very low fare for the short-distance passenger encouraged the overcrowding of the long-distance car for the first mile or so with short-distance passengers.

Mr. Dalrymple—That is so.

Mr. Stanley observed that was a point with which they were all familiar, and it was a matter with which they would have to deal. The point was referred to in the paper, and Mr. Madgen's remedy was to give the long-distance passenger rather more for his money than the short-distance passenger, i.e., give him a lower fare per mile. Having regard to the incidence of standing charges, that he thought was quite sound as far as it went, but he was afraid that it did not go far enough towards solving the problem, a problem which was going to be a very acute one in the future. That brought him to the second part of the paper, which was headed "Notes on Tramway Fares and Services." But he noticed that seven-eighths of the paper were concerned with fares, and the author dismissed services in a couple of paragraphs. Having regard to the admirably detailed way in which way Mr. Madgen had dealt with fares, one could have wished that services had been as exhaustively treated. He thought on this point the question of services came in very much. Unless they had some alteration in their present system of working, their cars would continue to be loaded for the first mile or two with local

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passengers, leaving through passengers at the starting point, the cars after the first penny stage being half empty. He agreed that they ought to encourage the long-distance passenger in the matter of fares, but he thought that more than this would be necessary to prevent short-distance passengers from crowding long-distance cars. Now taking the long-distance passenger, what was it that passenger wanted and what was it they at present gave him ? This was what they gave him—the car started in a thickly populated district, where there was great traffic, and therefore there was a low average speed on that part of the journey, and there was also a low average speed on the latter part of the journey on account of the number of stops. What that particular passenger required was not a car stopping 20 or 30 times and taking three-quarters of an hour to do the journey ; he wanted a car that stopped perhaps only half a dozen times, and did the journey in half the time. That suggestion, of course, might be Utopian from a tramway standpoint, but could not they do something to give him what he wanted ? If they could not, then he said in all seriousness tramway transport was not the transport of the future, or even of the near future. A short time ago many of their request stops were abolished, and it proved an unmitigated blessing to everybody concerned. There were far too many of those stops, and he suggested that policy should be further followed out. Why a tramway car should be called upon to stop every 150 yards was something of a mystery, because if stops were a quarter of a mile apart when one got out of the centre of a town, no passenger would have to walk more than 220 yards along the tramway to reach a stopping place. But if those passengers were within 220 yards of a railway station they would think they were near to it and cheerfully walk three and four times the distance night and morning. If a tramway manager started by making his stops very much less frequent, he could accelerate his services considerably, and probably do something else. Mr. Madgen referred to frequency of services, but he (the speaker) did think that the average passenger wanted a better condition of things in other respects. Perhaps something might be done in the way of non-stop cars, but probably he would also be told that that could not be done. They were not dealing with trains running at busy times of the day in thick traffic, say between Sloane Square and West Kensington. Perhaps they had been characterising his remarks as commonplace, but having had some experience of both tramway and railway work he thought the problem which confronted the District Railway was to say the least as difficult as the parallel problem which confronted them on the tramways. In conclusion, he thought that the question of acceleration and the running of cars more or less exclusively for long-distance passengers were problems which would have to be very seriously tackled, and unless they did tackle them, he did not think that tramway operators were going to be the people to carry that class of passenger in the near future.

Mr. H. R. Hogg (chairman, Sunderland District Electric Tramway, Limited) said that apparently the remedy suggested by Mr. Madgen was that they should develop propaganda for teaching the public. Well, he did not think the evidence before them showed that the public required any teaching in the matter at all. They all knew that the Underground and the Tubes had increased their fares something like 50 per cent. ; but the public had not resented it in the slightest degree. (Laughter.) If they resented the advance they would not travel by those means. But what did they find ? They could go into any of the Tubes between certain hours and they would find the people in the carriages packed like herrings, and all at the increased fares. He admitted that they grumbled at the lack of accommodation, but it was not the fares they grumbled at. Their trouble was to get a seat in the carriage. His contention was that the people were quite willing to pay reasonable extra fares. What was wanted was that the conditions should be altered by the Government to allow undertakers to make fair charges. In the case of his own tramway they did raise the fares, for which they had power, up to a minimum of 2d., but they had not exercised their powers for many years. One would have thought that would have made the people grumble, but they did not in the slightest degree; they crowded the trams just as much as ever, and no increase seemed to keep them off. He was sure the public did want better accommodation, and that was what tramway operators ought to be in a position to give them. This they could do if they were allowed to charge for the increase of expenses. The public were really quite reasonable and did not object to pay when they saw there were good grounds for the change.

Mr. E. R. Soames (member of Council of the British Electrical Federation, Limited), referring to the question of publicity and propaganda, said he did not see quite eye to eye with some of the speakers. The forecast of the Select Committee's report in the newspapers that day made it clearer than ever that there was the utmost need for educating the public as to the tramway industry of this country and transport generally. The Committee of the House of Commons which had been considering the traffic position in London, were reported in the morning's papers to be going to advise Parliament that the increase of fares was unjustifiable. Most of them had read the evidence given before the Committee, and every impartial observer must agree that there was an overwhelming case made out for an increase of fares. Further than that, in the case of the London General Omnibus Company, whose accounts were accepted, the impartial auditor distinctly stated that the fares were justified up to the end of 1918, and during 1919 further heavy burdens had been imposed. In face of that, apparently, the Parliamentary Committee were prepared to circulate to the public the statement that the present fares were not justified. He thought that was a very serious matter, and it was essential that a thorough campaign, a thorough education of the public, should be taken in hand. He knew that some people thought that it was difficult to get money, but he believed if they would think the matter over, they would realise that it was in their own advantage to put their hands into their pockets in a liberal way, so that this work of propaganda could be carried on in a varied and vigorous way. A few hundred pounds in propaganda work was useless ; a certain amount could be done, but thoroughly to educate the public into the needs, the value, and the progress of the industry as a whole, it would be necessary to put up a good deal of money. He could not help thinking that a matter of from £5,000 to £10,000 would be a flea-bite to an industry such as theirs, and the benefits to be derived would be out of all proportion to what would be a pettifogging increase in the expenditure of the whole industry. He really thought the matter was well worth considering and he sincerely hoped that everyone would realise the advisability, if the idea was carried into effect, of liberally supporting any fund raised for the purpose of educating the public and starting useful propaganda work. There was one point he would like to venture to make in connection with what Mr. Dalrymple had said in regard to ½d. fares. His own experience in England and Wales was that every increase of fare which had been put on had brought increased revenue, and he could not help thinking that it was the temperament of Mr. Dalrymple's constituents which compelled him to keep to his ½d. fare. In Wales and in the north of England the increases they had put on their fares in every instance had resulted in an enormous improvement of their revenue. Had it been otherwise they could not possibly have carried on in the way they had done.

Mr. J. M. McElroy (general manager, Manchester Corporation Tramways) said the one fact before all tramway operators was that operating costs had gone up 100 per cent. Someone had to pay for that, and that person must of course be the tramway rider. In this connection they must not allow themselves to draw wrong inferences. They had to discriminate between standing charges and running charges. They all remembered the inference drawn from Glasgow in that respect, where the standing charges divided up by the total number of passengers carried, led to a certain figure, which was rather less than a halfpenny fare, and the inference drawn from that was that the ½d. passenger was being carried at a loss. When the number of ½d. passengers increased, prosperity was shown on the Glasgow tramways system, showing that the inference was not correct. On the general question of increasing fares there had been throughout the country a very large number of systems where there had been an increase in fares. Their policy in Manchester was diametrically opposed to that in Glasgow, where they catered for the short-distance passenger. Manchester's policy was to give every passenger as long a ride for a penny as they could, and prior to the war they carried passengers three miles for a penny, with the avowed object of spreading the population and preventing congestion in the heart of the city. Statistics had revealed that the spread of the population of Manchester following upon that policy for 10 or 12 years was very remarkable. How were the increased costs being met to-day ? In some instances, of course, they had been able, not charging the statutory fares, to reduce the distance over which they carried passengers, but in other towns they carried the passengers at the statutory fares and were still only just able to keep their heads above water. They had just had an investigation made into municipal undertakings to see whether they could support an application to the Ministry for increased fares, but, having regard to the general experience in the country, they found they had no case for a general revision at present. In Manchester and other large towns, although they were meeting these increased expenses, they were meeting them in a way that was not beneficial to the tramway public. They were overcrowding the cars, giving less comfortable travel, and in that way they were able to meet the increased charges. He agreed with Mr. Dalrymple in thinking this great prosperity which was apparent in their undertakings just now would not be long lived, and in a few years time the public would have had enough of this scrambling and herding. It was not reasonable travel. He thought before long the public would demand in all large cities that they shall be provided with more convenient means of travel, and this could only be provided for them if higher fares are charged.

The Chairman, summing up, said the discussion had been a very interesting one, and he would like to make a few remarks on the question of fares. The discussion had brought out the general feeling that the short-distance traveller got the benefit of cheap fares to too great an extent. Several speakers had suggestively alluded to the desirability from the point of view of the health of the community, of getting the people spread as much as possible in a big city. Therefore their aim should be to consider fares from the point of view of giving the best value possible for the long-distance traveller and in not carrying the short-distance traveller at too low a rate. That rather pointed to an increase in the short-distance

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fare. The short-distance passenger, in addition to getting good value for his money, had also a tendency at busy times to crowd out the long-distance passenger. That was shown very well in connection with the long-distance omnibus traffic. In fact, in many towns in which they worked there was a restriction on the minimum fare in order that they should not interfere with the local tramway traffic, and in the early days they thought this was somewhat of a hardship. To-day they generally welcomed it, because at busy times they did not want 1d. and 2d. passengers crowding out passengers who were going six or eight miles into the country. The individual passenger to-day was getting more value for his money than before the war. The percentage of expenses to receipts in most undertakings had risen considerably, and it was only because of the great increase in numbers that the net revenue had also increased. The individual passenger had nothing to grumble at to-day in view of the depreciated value of money. He agreed with some of the speakers that there would be a good deal of grumbling while paying the extra money demanded, but in time, he thought, the public would be satisfied that they were getting good value for their money if in some way the overcrowding, which was very bad to-day, could be reduced. Several speakers suggested that this overcrowding could not go on, and he quite agreed. He did not know what the conditions were in Glasgow where Mr. Dalrymple carried an average of 20 passengers a car-mile—they must be stuck on the cars like flies. That sort of thing could not continue. A point to which he would like to draw attention was the necessity of bringing to the notice of those who have to deal with these matters, Members of Parliament and others, the disadvantage it would be in the national interest to allow the tramway undertakings to get into a bad state financially. That had been the difficulty in regard to some of the railway companies as they all knew. One railway company in the south eastern district had always been a laughing stock to everyone. He thought if they would examine closely into the reason why that railway company did not compare with the London and North Western Railway Company, they would find that for years and years that company was barely able to keep its head above water, whereas the other railway company paid good dividends on the ordinary shares. Therefore if one expected good services one must allow a living wage for the people giving those services, and in the long run he thought that could be got into the mind of anyone who was willing to take an unbiassed view. Unfortunately, most people objected to pay higher tramway fares, and unfortunately most tramway riders have a vote. Therefore following the ordinary political cries in these matters, the voter had to be considered first, and he was the special care of those who very often had to consider these matters. But there should be in the national interest a broader and a wider and a better view than that. He quite agreed that it was only by pegging away at it that they could bring that point of view to the notice of those who were called on to deal with such matters. He did not think there was anything more he could usefully add, except that he thought propaganda on behalf of the tramway industry, if possible, ought to be undertaken. It was a costly matter, but he did not want to be frightened by some of the remarks made that day. A great deal could be done efficiently by feeding with news items of the right sort those who were willing to publish them. A great deal could be done by every person connected with the tramway industry taking in hand their locality. It was in that way that he would rather ask them to consider the suggestion than by asking them that any such large sum should be immediately subscribed. A fund was required for publicity, and that fund ought to grow gradually, grow as they got experience, but much money could be wasted by making a big splash, and one got very little real value for it.

Mr. W. L. Madgen (director, British Electric Traction Company), replying to the discussion, confessed that Mr. Stanley's criticism was well founded. Sufficient space in the paper had not been devoted to services and allied questions. But there were really three papers in those eight pages—one dealt with the economics, one with sociological questions, and the last with the recurrence of attempts to deal with services. He was afraid that in respect of services he had not said enough. However, Mr. England's paper would supplement his own, and after he had dealt with fares there was very little space left to deal with some important matters connected with cost. He was glad that Mr. Fell had been able to spot those omissions and draw attention to them. There were four points Mr. Fell dealt with concerning the great hardships put upon tramway undertakings, and he thought part of their propaganda, if they were pleased to adopt the suggestions made in that direction, should be devoted to getting the tramway industry emancipated from those troubles. For instance, it would be a great help to all undertakings if the principles of rating applied to railways and light railways were extended to tramways. Light railways were not distinguished from tramways physically, and light railways only had to pay a quarter of the rates of a district, whereas tramway undertakings were fully rated. It would be a very great advantage if they could get adjustment in that respect. Then as to track maintenance. It was a curious anomaly that they had to provide both track and rails, as it was only the rails they wore out. Tramways did not wear out the road track—that portion of the track was worn out by the rest of the traffic—and it would be a great relief if justice were done to them there and they were relieved of that obligation. He thought there was another matter in which justice was demanded, viz., that they should not have to keep up the track they did not use. He supposed it was too late to expect any retrospective justice in regard to street widenings. In the case of light railways and many tramways, the undertakings were most seriously handicapped at the start by the cost of street widenings imposed upon them. Then in America and on the Continent the vestibules in the front and rear of the cars were used by smokers, and were pretty full in the rush hours. They were not allowed in this country to do that, probably through some mistaken notion that horses were still in front of the cars, and humanitarian reasons had to be considered. The obligations under the terms of the Act of 1870 were most unjust, inequitable, and stupid, and he was glad Mr. Fell had drawn attention to those matters. He was also very glad that Mr. Dalrymple was able to be there that day, and that he had drawn attention to the fact that every decrease of fares brought about an increase in gross revenue. If he understood Mr. Dalrymple rightly, his decrease in fares took the form of lengthening the stages. What he was doing, therefore, was simply stimulating traffic within the ½d. zone, in the centre of the city ; in other words, he was merely churning up the crowd where it was thickest. He could understand that not pleasing Mr. Dalrymple, and that he did not consider it a desirable condition for any city. It might suit the proprietors of restaurants or the cinema houses—their interests were promoted by congestion—but it did not suit the traffic manager, he felt sure. Mr. McElroy bore testimony to the effect of a more rational fare, the penny fare—the penny as a minimum—and he spoke of statistics having revealed that it had some effect in spreading the population, which was perhaps the greatest benefit the tramways as an industry could confer on humanity. Mr. Hogg said quite rightly that the public itself does not seem averse to paying the increased fares. Probably decent people were willing to do the right thing. It was all probably due to the little stunts of the politicians to be found in London, and those who appeared before them, and what tramway people had to do in their propaganda was to rouse the public and enlist them on their side, so that men of that type should not have a favourable environment for the continuance of their activities. He hoped he made himself plain. Mr. Soames rather alarmed him by mentioning the thousands of pounds required for propaganda purposes. It was not a question of thousands. They must all work it out in their own localities. They had friends in the Press, they belonged to various associations, and much could be done by personal effort locally which would have the support of all reasonable people. But a fund was really wanted, one of moderate size, and although that might not be the proper occasion on which to move a resolution, he would be very glad if the Council considered the question of propaganda, not only in regard to fares, but also on questions of rates, maintenance of track, street widenings, and means by which they could use the vestibules of cars, back and front, to the best advantage during the rush hours.

At the instance of the chairman a hearty vote of thanks was accorded to Mr. Madgen for his paper.

The Chairman then called on Mr. H. England who read the following paper.

POST-WAR TRAMWAY PROBLEMS.

By H. England

(General Manager Yorkshire (West Riding) Electric Tramways Company, Limited).

I regret that time has been so short and difficulties so numerous so as to preclude me giving that undivided consideration to the subject matter of this paper which its importance under present-day conditions warrants. Our worthy secretary, with his usual uncompromising determination, resolved that the entertainment and instruction of the members of our Association who attended this meeting should be as full and sufficing as heretofore, and as most of our friends were too fully occupied in dealing with daily difficulties, or reluctant to pledge themselves to present a paper to this conference, I was impressed or cajoled to put down a few headings that will, it is hoped, lead to a full discussion of problems that await or will call for solution in the tramway world.

When I found myself confronted with the actual work in connection with this paper I wrote to a few of my personal friends, asked for their assistance, and requested them to tell me which were the most pressing and important problems they now have to face. With one voice, pen, or typewriter they replied "Finance," and although there are many problems, they are all subsidiary to the one great overwhelming consideration of how to make ends meet and keep the various undertakings up to concert pitch. Finance includes almost all things. It embraces labour, materials, fares, renewals, in fact everything that goes to make the tramway machine efficient and fit to give that public service it is designed to afford. Because of this I label my first

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PROBLEM—FINANCE.

We have to find a way so to adjust affairs that tramway revenues shall be sufficient to enable operators to pay wages, purchase materials for daily use, and to leave a margin to pay a fair return on the capital invested in the undertaking, and also accumulate a renewals or reserve fund to replace the wasting assets at the end of their lives. Income is therefore our first consideration at the moment, and we are up against a grave difficulty. The revenue of a tramway can be increased in two ways. Firstly, by charging each passenger a higher fare, and secondly, by carrying a greater number of passengers.

Statutory undertakings have been badly hit by the conditions arising out of the war and the consequent depreciation in the coinage. The man in the street has readjusted his ideas of values as regards clothing, food, amusements, etc., etc., but when travel is concerned he seems to take a different view and demands his post-war privileges at pre-war prices.

Perhaps I am in error in making that statement and the real fact of the matter is that the Government, as represented by the Board of Trade, is the stumbling block, and our remedy is against the Board of Trade, and we should not blame the consumer at this stage because in most instances the public have readily assented to an increased charge recognising the impossibility of having the same facilities at the pre-war price. Our difficulty is to find a way of making the Government department see reason and to grant us relief before our undertakings get into a state of disrepair and inefficiency.

Company owned undertakings are in a different category from Corporation tramways in this respect, but it cannot be good for the town or the State to have rate-aided tramways, and the only sound and lasting method is to conduct a trading concern on a strict financial and self-supporting basis.

As regards companies, it is apparent that unless the capital charges are met the company must go out of business, because it would be foolish to attempt to run a tramway for pleasure when there are so many more attractive and less strenuous ways of killing time. It really comes to this, we must have a sufficient income and, in my opinion, the only way to obtain the revenue is to charge each passenger the sum it costs to carry him the distance he travels. This cost is, of course, made up of working expenses, depreciation, and capital charges.

Why we should be restricted to such absurd fare limits at this day I cannot see, because the public are fully able to take care of themselves, and if we foolishly demand an exorbitant fare, our business will disappear and our last state would be worse than the present. There is an economic limit to fares chargeable on a tramway, and as soon as that limit is exceeded away goes the business.

Whilst speaking of fares I think I should mention for your consideration the advisability of demanding powers to charge higher fares on Sunday, Bank Holidays, gala days, race meetings, and special occasions. We are called upon to pay higher wages on these days; it costs more to give the service, and we are entitled to increase our charges. Not only so, but the great bulk of the traffic on these days is purely pleasure, as distinguished from commercial traffic, and it cannot be argued that a higher fare would be in any way a restraint on trade.

Again, there is that bugbear of workmen's fares. Surely it is high time that anomaly was swept away. The so-called working classes are now drawing more cash per week than the middle classes, or even many professional men, but who can expect a change of this kind when vote-catching politicians rule the destinies of the country and expediency supplants justice.

I commenced by saying that tramway revenues can only be increased by two methods, viz., by raising fares or by carrying more passengers. I have dealt with the fare question, and I have very little to say about the alternative. Look at the published records of tramways and it is demonstrated that the great majority of systems are full to capacity and it is a vain hope to look for relief from additional passengers. I make that statement in a general sense because what may be true of the many may be untrue of the few; still practical men know full well that the net result on most systems, if additional passengers involve a greater number of cars in service, will be adverse.

We now come to the other side of the ledger, and one is at a loss to decide where to begin. There is so much to say on the labour question, and on the subject of wages, that it is hopeless in the limits of this paper to try to write even a portion of what could be written in this thorny subject. I am glad you are all thoroughly acquainted with this matter; glad, not because you have spent weary days and sleepless nights scheming and cogitating, but because it saves me the nauseous task of reviewing the past four years which have given rise to the problem that confronts us to-day. Suffice it to say that wages and conditions of employment in the tramway industry have kept pace or even outstripped the demand made upon other industries, and the only difference is that whilst the increased charges necessitated by the alteration of conditions and increase of wages are passed on by the trader or manufacturer, we are called upon to do the impossible and carry the burden ourselves.

As regards materials, the position is chaotic. We are paying any prices asked by the manufacturers, and even then have difficulty in obtaining deliveries. I am tempted to ask whether we cannot do a great deal more to help ourselves in this matter. Surely a way can be found to standardise the bulk of our daily stores, and to buy on a co-operative basis. Things have come to such a pass that we must put aside all our little preferences and prejudices, and the engineer who must have something different of his own design, simply because it is his own wee lamb, must go with the crowd and help bulk production and diminished cost. Let us encourage brains and inventiveness by all means, and set up a standing committee to consider and decide upon suggested improvements to standardised articles, but keep them standardised, embodying all the improvements that are discovered from time to time.

By co-operative buying I mean to suggest that we, a body of organisers, should be able to devise an organisation to collect data of all materials in use on our tramways and to place bulk orders with manufacturers. To illustrate my meaning, take gear wheels as an instance. I take it that no manager would have any objection to stating now how many gear wheels of a certain class he would want for next year. His sole object is to get the best quality gear wheel at the lowest market price, and the only way to do this is for a manufacturer to be employed as constantly as possible on a particular type of gear. Why cannot this be done? By organisation bulk orders can be placed, not only for gears, but almost all the material we use, and we should benefit by quality, workmanship and price, and the manufacturer by increased output and economy of production. I do think that a revolution in order placing can be brought about with advantage to all concerned, and I trust this suggestion will be fully considered.

My next point in the finance problem is depreciation, renewals, or reserves, designate them as you will. In 1900 and subsequent years when electric tramways were being installed at a rapid rate, renewals funds were calculated and set aside on the basis of prices then prevailing. The funds have accumulated, and now, when renewals beckon to us like a spectre we are horrified to find that the cash available is about 150 per cent. less than will be required to renew our wasting assets at prices now current. The only solution of this problem is to earmark every possible penny for renewals, and any balance will have to come out of revenue. Not a cheerful or encouraging prospect, especially for those undertakings that have patiently borne the lean years building up and making traffic, and now to find that present-day revenue must bear costs that no man could have foreseen.

There is another disagreeable item in connection with reserve or renewal funds that are invested in securities. Almost all securities have depreciated, and it is apparent that when we have to realise to enable work to be undertaken we shall get back much less than we put in, so that we seem to be hit on all sides. I consider I have said enough on the finance problem. It isn't an attractive or cheering subject at present, and I gladly leave it to discuss other things.

PROBLEM NO. 2—ROLLING STOCK.

The problem here for your consideration is the one often discussed, but recently with gathering force, viz., is the design of the cars we now use the right one, and are the materials the best for the purpose? We seem to be committed to ugly, unwieldy double-deck tramcars, and I am afraid the time has gone by when any radical alteration will be made on systems now in operation.

The only thing that can be said in favour of the cars at present in use is the seating capacity, but many objections can be raised to their use, the chief being excessive weight, time taken in loading and unloading, difficulty of fare collection, and so on. Excessive weight per axle not only means large maintenance costs of cars, but it also carries with it heavy maintenance cost of track, and as these are the two chief items in the repair bill of a tramway undertaking, we cannot pay too much attention to them. Nobody will contradict the statement that cars fitted with roof covers are the acme of ugliness, nor will they seek to deny that they are ungodly current gluttons and voracious enemies of rails.

The question is, are we on the right lines regarding cars, and is it too late to make a change if a change is found to be desirable? I really think this matter should be fully investigated, and we ought not to go on blindly buying cars of this pattern simply because the other fellow does it.

One thing is certain, the design of cars should be simplified; a freer use should be made of steel and malleable iron, and the use of wooden corner posts and intermediate pillars, which in many cases require renewal in a few years' time owing to dry rot, etc., should be stopped. We should eliminate all brass work, gold leaf, and fancy stunts of that description. They are not necessary to make a car look clean and attractive, but swallow labour, and are a continual source of annoyance and expense. We want no carved or pressed wood work or fancy mouldings, either in the upper or lower saloons. We want no places where dust can lodge and which require daily cleaning; in fact, the plainer the interior of a car can be made the better from the upkeep point of view and also the health of the passengers.

Car equipments should give ample clearances. Equipments are on the market to-day that only give a clearance of from two to three inches between the rail head and the bottom of the gear

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case. This is not sufficient, and if we are to get the best out of our tyres and gear cases, equipments must be designed to give much better clearances.

The present springing of cars is faulty. It is a sure indication that this is a recognised fault when one finds managers all over the country experimenting and trying dodges to improve springing. Wherever I go I find that some alteration has been made in the springing. This may be a problem fairly easy of solution, but it should be tackled.

PROBLEM NO. 3—MAINTENANCE OF ROADS.

Under present traffic conditions, the abnormal growth of heavy motor traffic, and general wear and tear of wheeled traffic, the upkeep of the paving between tramway tracks and on the 18-inch margins has become a terrible tax on all tramways. Unfortunately the paving is not the sum total of the damage, the concrete foundations of tramways also suffer severely. I have noticed, particularly in places where the concrete foundation only extends to the width of that portion of the road maintainable by the tramways, that in innumerable instances the concrete has broken longitudinally with the rail, and—in my opinion—this damage is caused by the passage of heavy vehicles on the unsupported portion of the concrete.

In places where the whole width of the road, from kerb to kerb, is concreted such cracks are not often found, but I cannot suggest any solution to this problem unless the local authorities can be persuaded to excavate and concrete their roads when the rails and road bed of tramways are due for renewal.

Is it possible for us to get any relief regarding the maintenance of road surfaces?

We have discussed this matter from time to time without attempting to press it home, but conditions are daily becoming worse, because of the great increase of heavy vehicles, and road maintenance is growing by leaps and bounds, and why we as tramway operators should bear the entire cost of maintaining road surfaces which we do not use I cannot imagine.

PROBLEM NO. 4—MOTOR OMNIBUSES.

Motor omnibuses have forged ahead during recent years, and I am wondering what their future is in relation to the passenger-carrying industry in this country. Many wild statements are made by out and out motor omnibus advocates, but it is certain the motor omnibus is rapidly gaining a place that many people a few years ago thought unlikely. It is difficult to free one's mind entirely from the traffic conditions of London and apply one's judgment solely to the conditions we have to meet daily in the provinces, but I have tried to do this, and have come to the conclusion that motor omnibuses in provincial towns cannot compete successfully with tramcars for handling dense rushes of traffic, but in the future tramway tracks will not be laid into suburban and country districts serving comparatively sparse populations, and in such districts the motor omnibus is undoubtedly the vehicle of the future.

The cost of carrying a passenger is the measure of economy as between omnibuses and tramcars. By cost I mean all charges, operating, capital, and renewals, and there is a wide margin at present in favour of cars under provincial conditions.

The question of road maintenance, or rather of road adaptation and maintenance, is throttling the motor omnibus business at present, and until this question is settled on a national basis, the motor omnibus will not take its rightful place as a passenger-carrying vehicle in this country. Of late most exorbitant demands have been made by road authorities on omnibus owners and operators, and the matter has got to such a pitch that something will have to be done, and done quickly to decide this question.

Corporations are agreeing to pay road authorities a round sum for road adaptation, and a contribution per omnibus mile for road maintenance. One company of which I have knowledge is paying the ridiculous sum of 3d. per omnibus mile for road maintenance charges, and Corporations have even made an offer of such a sum as £700 per mile towards road adaptation.

A company which is subject to the whim of licensing authorities is obviously not in a position to pay down a lump sum for adaptation, even if such a charge were fair and reasonable, but unless a company is agreeable to pay a contribution for road maintenance, I think they will have great difficulty in getting licences. This is a national question, and one that should not be left to every small road authority to meddle with.

If we have to pay a contribution for road maintenance, let everybody pay alike, but I do think it most unfair to compel passenger-carrying vehicles to contribute and leave trade vehicles of double the weight and of equal speed absolutely free of all charges. Unless you are going to introduce the old turnpike gate and toll bar I think it is illogical to make any charge on a particular class of vehicle, and the roads should be put in a condition fit to carry present-day traffic, which of course includes motor omnibuses, and no charge whatever should be made.

PROBLEM NO. 5—HOUSING.

I don't mean the housing of our workpeople, although that is a matter in some localities that caused us much annoyance and difficulty, but I refer to the housing and town planning schemes many local authorities are now considering. Tramways are required, and as many of the housing sites are some distance from the centres of the towns some means will have to be found to serve the people who will reside in the houses. Extensions of tramways at to-day's prices are unthinkable unless assistance is afforded by the authorities, and even then, in the present unsettled state of affairs in the traction world, I question much whether any company is warranted in sinking money to meet demands which in all likelihood cannot yield an adequate return for some years on the capital it will be necessary to expend. It is a pity that tramway companies, owing to insecurity of tenure, and, at the best, limitation of tenure, are prohibited entertaining extensions which are necessary for the development of the districts they serve.

In the past company tramways have been constructed and services run in districts that were really not ripe for development at the time the tramways were laid, but in the hope and expectation of future profits, services in excess of public requirements have been run to induce traffic, and now when the period of patient waiting is beginning to be rewarded, companies are faced with excessive charges in all directions and their meagre profits seem likely to disappear entirely.

The efforts of companies have of recent years been sterilised because of the powers of purchase which may be exercised by local authorities, and in many cases the period at which local authorities are empowered to purchase is drawing near, so that it is quite impossible for any company to put down new lines unless assured of an immediate return.

A Corporation Tramways Department would be affected rather differently by the various town planning schemes, but even Corporations will have to step warily otherwise the department will find itself operating a considerable mileage of tramways at a loss. I assume care will be taken that whenever sites are laid out for new buildings, roads will be made wide enough to give a high speed tramway track free from other traffic, and on these lines the future development of tramways in this country will depend.

We have sacrificed speed, and have made what are virtually street railways into a hybrid between a hackney carriage and a private brougham. We stop our cars at every street corner, and even then get complaints that the wife of a town councillor has to carry her parcels 20 yards from the car to her door step. The time has come when this sort of thing should be stopped, and our tramways should take their rightful place in the traction world, and be regarded as high speed street railways, leaving the finicking door to door traffic to a different class of vehicle entirely.

PROBLEM NO. 6—TO PROVIDE USEFUL AND REMUNERATIVE EMPLOYMENT FOR DISABLED DEMOBILISED MEN AND SPARE HANDS.

On some systems the task of finding suitable work for disabled men has proved very serious. It is bad for the job generally to have a man who is regarded as a pensioner, and who is not doing his "whack" on the premises, and unless work of a suitable nature can be found for such a man I think it would be almost better to allow him a sum, if there is any moral obligation so to do, and tell him to stay away.

Many undertakings have a sufficiently serious problem to solve regarding spare men, particular places catering for a seasonal traffic or where the traffic is irregular and fluctuating. This is one of the problems brought about by the last wages settlement, and it is the general opinion of most of the managers with whom I have come in contact that there is not sufficient elasticity considering the peculiar nature of tramway employment.

If public demands are to be met we must run our cars regularly and on time, and to ensure that this is done we must have available a percentage of men to understudy those who may be sick or idle or who have missed their duty because of other reasons. "Made" work pays nobody, and in very few instances has it been found possible to provide suitable work of a remunerative character for men who are not required to drive or conduct but who have to be paid.

PROBLEM NO. 7—SKILLED AND UNSKILLED LABOUR.

The tendency of the day is for unskilled labour to demand and obtain the same rates of pay as skilled labour, and if this is to continue I wonder what the result will be in the future. Are we to denude the country of skilled craftsmen? Really that is where the present-day development will lead, and I cannot think the peril of this is realised by those who have so freely granted the extortionate demands of unskilled labour. There is no incentive for any youth to stick to a particular trade and to make himself an efficient and capable craftsman, and in days to come we shall have a race of handy men, jacks of all trades, incapable of doing a first-class job in any particular calling.

PROBLEM NO. 8—PEAK LOADS.

Cannot some effective steps be taken to flatten our peak loads? During the war an effort was made in this direction, but the response of labour was negative. It means so much on a busy system to spread the peak load rush over a wider period, and the advantages to the public are so patent that one would have thought the proposal would have met with immediate acceptance. As the better distribution of traffic not only means improved facilities for the public, but also a marked saving in the wear and tear of rolling stock, economy in the generation of electric energy, and to some extent diminution of

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split turns, a further effort should be made to stagger the hours of commencing and finishing work.

CONCLUSIONS.

There are several problems we shall be called upon to face, either now or in the immediate future, in addition to those I have dealt with, but as this paper is becoming unduly long, I will content myself by mentioning them without comment in the hope that one or other of those present at this conference will deal with them in discussion.

There is the traffic problem in large cities and the difficulty of providing transport.

Power house difficulties.

Price and calorific value of fuel.

Provision of new plant and position of owners of generating stations under the new Act.

Restoration of efficiency of organisation and equipment.

Electrification of local railway systems.

These are only some of the many problems that can fittingly be discussed. One other matter I wish to mention, viz., publicity. Every member of our Association knows of the great work accomplished by our good friend Mr. Blain in London, not only in his safety-first campaign, but also in his publicity department. What is known as the traffic combine is a glorious example for us to copy in our efforts to put the people wise, as our American friends say, and for some time past I have held the opinion that we are sadly lacking in propagandism. I feel I shall be met by head shaking and at the best doubtful acquiescence, but I do think we hide our light under a bushel, and we have a lot to gain by letting the public know many things we now keep locked up in our bosoms. A transport concern is open to the carping criticism of every jackanapes who has the effrontery to raise his voice, and we suffer misapprehension and calumny at the hands of the few. That is immaterial if we are understood by the many, and our limitations and difficulties appreciated by the public at large. I have heard it said that a tramway company, by the very nature of its business, can never be popular, but we can reduce that inevitable unpopularity to negligible proportions by judicious publicity and an effort to make the public understand.

Diplomatic pars on the growing cost of operation prepare the public for an increase of fares, but it is perhaps unnecessary for me to enter into detail. What I am now trying to do is to interest this Conference in the question of a permanent publicity campaign for the furtherance of our interests, and I hope and trust this subject will be fully considered before it is rejected.

The Chairman said the first thing to do was to pass a hearty vote of thanks to Mr. England for having stepped into the breach at short notice. It was not only an excellent paper, but an excellent one to discuss.

The motion was agreed to by acclamation.

DISCUSSION.

Mr. E. H. Edwardes (general manager, Lancashire United Tramways Company), remarked that no doubt they had listened with great interest to Mr. England's summary of his paper, from which it was fairly clear that they were all pretty much in the soup. He did not propose to touch on fares any more, because he thought some of them had got nearly tired of fares. Everyone agreed that their statutory fares in many instances were too low, but there had been no suggestion that afternoon as to how they were to get over the difficulty. Both Associations have got out hosts of figures, and their case did not look very rosy, but he agreed with one of the speakers that although it might appear that some of them were in a fairly good position now, the trouble they all had to consider was what was going to happen next year or the year after. He was entirely in accord with Mr. England in reference to standardisation of plant and material, and it seemed to him that the matter had been tackled in a somewhat slovenly way by the tramway authorities and by all concerned. He thought he was right in saying that, except in the case of overhead material, operators were very little better off in the standardisation of equipment than they were ten years ago. He thought a resolution from that Conference to the new Council to the effect that they should tackle the job in all seriousness in the coming year would be of some service. He did not altogether agree with Mr. England in regard to the size of cars. Of course, it depended a good deal on the particular system, but it appeared to him that a tramcar with a very large seating capacity is the type they ought to look for, because the motor costs would be less. Bearing in mind the heavy cost of labour, he thought members knew pretty well his views as to the beautifying of their cars, and it was unnecessary to enlarge on the subject. He thought they would all soon come to the same opinion as he did some years ago that elaborate gold-leafed decorations did not earn much money. Mr. England touched on the question of gear cases. It was a fact that in his own equipment gear cases were only 1 in. and 1½ in. or 2 in. from the railhead, and owing to the state of some of the paving, there was very great difficulty in keeping some of the gear cases on the cars. A gear case now cost about £9, and if the track was not in perfect order would only last about nine days. The gear wheel costing about the same amount of money, it was best to do without them. He had nothing more to add, except thanks to Mr. England for his capital paper.

Mr. W. Vincent Edwards (engineer and general manager, Hastings and District Tramways Company), referring to the standardisation of rolling stock and parts, said it was quite true there was a committee of the Council on standardisation, but it seemed to him that in one action they were pleasing the manufacturers rather than the operators. They had just fixed the centres. He would like to know the thickness of the tire that is scrapped with the use of the centre that had just been adopted as the standard. It struck him that they would have to scrap a much greater thickness of worn-out tire than if a larger centre were adopted. He did not think it was possible to wear a steel tire down to five-eighths with the diameter of the centre that had been adopted as the standard.

Mr. R. Humphries (tramways engineer, Birmingham and Midland Tramways Joint Committee) said that with regard to the question of standardisation he was not so pessimistic as Mr. Edwards, because during the last ten years a lot had been done. They should follow the lead of those doing the work. The tire-makers had done considerable work, and the truck builders were doing the same, but the great difficulty was that every one, especially the engineers, had their own standards, and they would not fall into line with the manufacturers and designers, who in many cases had great experience in what they were designing. The suggestion therefore was that in order to make progress we should take the makers into our confidence as to what was wanted and what they wanted it for. Very often the manufacturers had something in stock which was designed for the same purpose and which they could supply with very quick delivery. With regard to the size of cars, of course he could only speak on the engineering side, but he was of the same opinion as Mr. England that the type of car they should standardise should be the American single-decker. The Americans had passed through this phase, and they were going very strong on their safety car—the light single-deck car holding 34 passengers with vestibule ends, all bulkheads abolished, and weight cut down to a minimum, with a maximum seating capacity. He could only speak from experience with the 3 ft. 6 in. gauge, but he felt that on such a gauge the single-deck car had a very great future before it. Undertakings around Birmingham and the Black Country during the last few years had put on quite a number of that type of car on the road, and their experience—of course their roads were of an inter-urban and suburban rather than heavy city services—had been that with cars of that type earnings were as much per car-mile as they were with top covered double-deckers, and that fact in itself gave food for thought. They could run two cars to one of the other type on the same current consumption, and they could give more frequent services. The fast-running light car with a low current consumption was the car which he personally thought they had got to look to if they were to fulfil their role as successful passenger carriers.

Mr. A. L. Barber (secretary, London United Tramways Company) raised a point in connection with the electrification of local railway systems. In quite recent years the London and South Western Railway Company had electrified their suburban systems and run a ten minutes' service of electric trains to and from Wimbledon and Richmond on routes which were practically parallel with those of the tramways operated by the London United Company. He thought their experience so far had been that they might have lost some long distance tramway travellers in the morning and evening, but they had certainly lost no local traffic, and indeed had possibly got more local traffic. One would be interested to hear from Mr. Fell whether the electrification of the London, Brighton, and South Coast Railway had had any effect on the London County Council Tramways in South London, as the lines of the Brighton Railway are practically parallel all the way through with tramway routes.

Mr. C. W. Mallins (general manager, Liverpool Corporation Tramways) said he had read the paper with a great deal of interest and noted that both papers just read followed the same train of thought in regard to the question of fares. The papers were contributed in that way, and one fully appreciated it, because after all it was perfectly clear and essential that something should be done to alter the fares, and that improvements could only be introduced if such an alteration were made. That old stumbling block which had existed since the early seventies must be removed before anything really practicable in the way of altering the basis of their fares was possible. The Board of Trade, unfortunately, as the paper rightly said, had set themselves against any alteration in fares, but he thought it would not be difficult to produce sufficient evidence to convince even the Board of Trade that such a change was necessary. They heard of high speed systems of traction. Now the high speed system was absolutely essential if they were to hold their own, but some attempt must be made to separate the short distance from the long distance passenger. Mr. Dalrymple told them how the thing was done in Glasgow, and they all appreciated that, but the conditions there were very different from the conditions in many other provincial cities on account of the density of the population in the

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centre of Glasgow, which gave them an opportunity of showing results which could not be shown elsewhere. Now if something could be done to separate the long distance from the short distance passenger, and get a high speed system for the long distance passenger to the suburbs, he was sure they would be going a long way towards solving a difficult problem. It was very difficult indeed to solve this problem. They could not accomplish it on ordinary tram routes where the short distance passenger is difficult to deal with. It was a question whether it could be done by motor omnibus and tramway system combined, the motor omnibus dealing with the long distance passenger with only few stops, and the tramway system dealing with the central or short distance traffic. He thought that was one way out of the difficulty. But they must come back to the question with which they started, and that was the question of fares. He thought it was in the interest of every transport organisation engaged in passenger carrying traffic to co-operate and make some genuine attempt to get the law altered in such a way as to enable them to meet their liabilities as they should be met, because, as Mr. Dalrymple had foreshadowed, there was something lying ahead of them that required serious thought—they all appreciated that point. He, personally, appreciated their difficulties so far as the future is concerned. They might have a great slump in passenger traffic and they must face it, and in addition, the enormous expense of renewing their track and rolling stock, and indeed expense in every other detail. There was no doubt about that, and they could not do all these things without getting a proper fare. Boiling it all down to its logical basis, the way to accomplish all these things was simply to get a proper fare, and to make the passenger pay for his ride. As to the question of the type of rolling stock, that matter was on the same basis. One could wish one could get as good a return on a car seating 30 passengers as on one seating 70 or 80 passengers. That was an absolute impossibility. They were met at once with the difficulty of cheap fares. It all came back to the fare. If they could get in this country the same fare as in the United States, viz., five cents.—which was equivalent to 2½d. per passenger—no matter how short a distance the passenger travels, it would be all right, but when they got less than a penny per passenger for a very large percentage of their traffic, the matter was very different. Consequently they had to go in for a car of large capacity which gave greater earning powers owing to the present scale of fares.

Mr. Ernest Benedict suggested with regard to standardisation that, if it had not already been done, the combined Councils of the two Tramway Associations should make some arrangement with the Engineering Standards Committee, and settle what parts of the track and what parts of the overhead equipment they would like to have standardised. With regard to increasing the capacity of the cars he ventured to suggest, from the many occasions in which the cars were running half empty, that some steps might be taken by adapting fares, or in some other way to fill the cars so that they might have a better average load, which of course would react upon the receipts. He made that suggestion with great timidity because he was not a tramway manager.

The Chairman (Mr. R. J. Howley) in summing up said he was very glad to have Mr. Benedict there, and the members were very glad to meet the first secretary of the Association. He thought he could answer some of Mr. Benedict's remarks in regard to the British Engineering Standards Association. He happened to be one of the representatives of the Association on that body. The Association were occupied in standardising a very large number of materials and types, and they had dealt with rails, fish plates, and the steel work of the permanent way. They were now engaged on tires, axles, and wheel centres. Mr. Edwards drew attention to the question of getting full wear out of the tires. When the Standards Committee came to examine into the size of wheels in use throughout the United Kingdom, they found very big variation, and after full discussion a centre size was adopted, having fully in view that there would be cases where it could not be adopted; but it was adopted with the view that it should be the standard centre for the future, and that car builders should adapt themselves to that size in the future designs of trucks. The Council of the Association at a recent meeting had under consideration the setting up of a standing engineering or technical committee. He thought the future work of that Association would now very largely tend towards standardisation and engineering problems in connection with their industry. He strongly advocated the formation of this standing committee to whom all these problems could be submitted. It would form a sort of background to the few representatives which they were allowed to have on the British Standards Association. Coming to the matter of finance, which was to a large extent the governing factor of the whole of their business, he thought they had to make good this point to the public, to Members of Parliament, and to others who would be considering transport, and that was that the present overcrowding and uncomfortable riding could only be overcome, and the services improved, by a large expenditure of capital. Now that capital could only be found for an undertaking that was in a financially sound condition. The public were very agitated about their present conditions of travel, and as one who travelled about London a great deal, he was in sympathy with them. The overcrowding at times was almost beyond endurance, but that could not be remedied without a very large increase in the rolling stock of the various undertakings, both railways and tramways, and an undertaking which was not financially successful was not in a position to find the additional money required for new cars. There were a number of other points raised in the discussion which were very interesting. There was the question of the maintenance of the roads. They should carefully consider that, and he thought they should have prepared and have ready for use when the opportunity came a good case for some relief under that head. One of the serious matters with which they were faced to-day, and to which insufficient attention had been called, was that of deferred repairs and the question of delayed renewals. Undertakers had not been able to spend money on repairs and renewals during the war. If the estimated cost of deferred repairs and renewals was taken into consideration he thought many undertakings would show reduced profits or no profit at all. The ordinary profit and loss accounts of the years of war were quite misleading on account of this liability for maintenance and repairs which had been postponed. Any degree of revenue would test whether they were going to be able to exist on the present rates of fares or not. It would be foolish to allow the tramway industry to get into a state of insolvency. To require an undertaking to go down the hill before any help could be given was not to the good of the public, and he hoped that the new Government department which was going to supplant the Board of Trade would take a broader and a better view than the old Board of Trade did on matters of that sort.

Mr. England in reply said he did not think it was necessary to go over the ground covered by other speakers and contented himself with thanking the conference very heartily for their vote of thanks.

The conference then concluded.

THE ASSOCIATION DINNER.

The annual dinner of the Association was held in the evening at the Connaught Rooms, the Hon. Sir Arthur Stanley, Chairman of the Council, presiding. The following attended :—

R. Ainsworth
J. G. Ames.
S. E. Baker.
Alex. Balfour.
G. Balfour, M.P.
Lieut.-Col. C. Barber.
E. Barralet.
G. B. Battson.
A. H. Beatty.
W. W. Beaumont.
J. Beckett.
H. R. Beken.
E. Benedict.
P. Bingley.
H. E. Blain.
F. Bland.
F. Bourne.
J. W. Brooks.
P. B. Brown.
J. Browning.
N. D. R. Bruce.
B. Buckley.
F. Burfoot.
C. D. Burnet.
J. L. Burton.
J. F. Caine.
Major J. Caldwell.
H. Camp.
G. Campbell.
S. H. Callow.
J. Cameron.
J. Mel. Cater.
Major Chapple.
W. Churcher.
N. Clough.
F. Coates.
H. P. Conibear.
A. N. Connett.
F. Coutts.
A. Coveney.
G. F. Craven.
E. E. Daglish.
W. D. Dawes.
P. S. Dennison.
A. de Turckheim.
E. H. Edwardes.
W. V. Edwards.
S. G. Elliott.
A. G. Engholm.
H. England.
A. L. C. Fell.
H. J. Ferguson.
E. H. Flemming.
J. D. Flemming.
S. R. Fletcher.
W. E. Freir.
J. J. Fry.
Leon Gaster.
T. B. Goodyer.
Selwyn Grant.
C. Gregory.
S. C. Hackney.
S. Hann.
L. E. Harvey.
W. R. Hackworth.
W. H. Hawley.
J. H. Haynes.
J. M. Henderson.
E. D. A. Herbert.
F. Hewer.
C. H. Hill.
W. T. Hill.
A. Hoare.
H. Holliday.
A. J. Hollington.
H. H. Holmes.
P. Hooper.
W. H. Hopking.
C. W. Hough.
R. J. Howley.
J. Hunter.
W. E. Ireland, O.B.E.
Fearnside Irvine.
W. Ivy.
C. J. Jewell.
W. E. Jewell.
A. Johnson.
J. J. Kelly.
J. D. Kiley, M.P.
H. W. Kimber.
Geo. Kitchin.
E. H. Lean.
S. A. Ledger.
S. Loosen.
W. L. Lorkin.
H. Lotery.
P. N. Lowndes.
W. McGill.
W. L. Madgen.
C. W. Mallins.
J. D. Manning.
H. Martin.
A. V. Mason.
M. Masuda.
H. F. Maynard.
R. Mayne.
H. G. Merrick.
H. E. Midgeley.
A. J. Milne.
J. F. Moss.
R. Murray.
S. Newman.
A. Norton.
P. Olver.
S. E. Osborn.
W. B. Pickering.
R. P. Pilsbury.
W. Purse.
G. A. Roberts.
L. M. Rowe.
B. T. Rumble.
W. Rutherford.
Major F. E. Saunders.
H. M. Sayers.
F. Schofield.
E. J. Scown.
E. E. Sharp.
G. J. Shave.
Capt. K. Shaw.
W. Shearer.
—. Shire.
—. Simonds.
C. C. Skeats.
M. L. Slattery.
E. W. Sleight.
S. G. Smith.
W. Alderson Smith.
R. A. Smithson.
E. R. Soames.
J. Somper.
H. King Spark.
C. J. Spencer.
M. O. Spicknall.
Hon. Sir A. Stanley.
G. V. Stanley.
C. D. Stanley.
F. E. Stanley.
W. A. Stevens.
A. W. J. Talbot.
E. Russell Taylor.
T. E. Taylor.
C. G. Tegetmeier.
W. B. Templeton.
W. Thom.
L. O Thornbury.
J. B. Tippetts.
A. Toms.
H. E. Townell
W. H. Troake.
H. J. Troughton.
W. Turnell.
W. H. Turner.
W. G. Verdon-Smith.
V. Wallington.
A. Walton.
J. Whitby.
H. L. White.
H. R. White.
A. G. Whyte.
A. M. Willcox.
H. L. Williams.
A. Wilmot.
A. E. Wray.
W. Wright.
W. Wyld.

Women displaced at Manchester.—From about 880 women and 250 girls employed on Manchester Corporation Tramways, the number has now been reduced to 24 women conductors on the cars and about a dozen trolley girls. It is expected that no women will be on the Manchester outdoor tramway staff within about two weeks.

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METROPOLITAN TRANSPORT.

REPORT OF THE SELECT COMMITTEE.

The Select Committee of the House of Commons appointed to investigate the congestion in the existing means of transport in the Metropolitan area, together with the question of fares, issued their agreed report on July 28. The Committee comprised Mr. Kennedy Jones (chairman), Col. Sir F. Hall, Col. A. Pownall, Mr. Lane Mitchell, Col. Sir Archer-Shee, Mr. Geo. Balfour, Mr. C. Edwards, Mr. J. D. Gilbert, Mr. C. F. Higham, Mr. Foreman, Mr. C. W. Bowerman, Mr. J. Jones, Mr. Newbould, Sir R. Park Goff, and Major J. Hall.

The following is a summary of the report:—

The Committee, appointed on May 29, 1919, began their sittings on June 2, met on 22 days, and took the oral evidence of 36 witnesses; they invited and examined memoranda from many authorities and organisations interested in the problem; they also discussed and considered statements forwarded by members of the public.

At the outset the Committee put on record the one outstanding fact which, by the open admission or tacit agreement of every witness who came before them, discloses the full and adequate reason for the demoralisation of traffic in Greater London. It is the absence of a Supreme Traffic Authority for Greater London, possessing executive powers to control, co-ordinate and initiate, and to safeguard and further public interests. Owing to the absence of such an authority there is not a single important recommendation made in the past for the improvement of London traffic, for the avoidance of congestion, or for the benefit of the public—and innumerable Commissions and Committees have devoted much time and thought to this subject—which has had the slightest chance of being carried into effect. The Committee are well aware that the suggestions they now put forward will not share any better fate unless centralised control is at once brought into existence. The immediate creation by Parliament of a London Traffic Authority can alone remedy the present intolerable conditions.

Sole Condition of Reform.

Every phase of the transport system of London has been scrutinised through the witnesses examined; they have also had laid before them many important memoranda by leading experts, and, in response to a request to the local authorities and to the public, they have received and considered much useful information which has helped to explain the outstanding aspects of the present state of the traffic facilities of Greater London.

An immediate solution of the problem is imperative, since it has reached the dimensions of a public scandal. The Committee have formed clearly defined views upon remedial measures, but, as matters stand, not one need be carried out. They may counsel complete co-ordination of traffic, avoidance of senseless and costly competition, regulation of routes, revision of the existing system of fixing fares, but they are powerless to effect a single reform, failing a supreme authority with statutory power to enforce their recommendations. The Committee may state that various vehicles now being used on the tube railways and tramway routes and by the omnibus companies are capable of great improvement; they may advise that improved types should be introduced at the earliest moment, but not one of the several transport organisations need pay any heed to these recommendations, if there is no supreme authority capable of insisting on effect being given to them.

The Metropolitan Police have been given powers to regulate the traffic, but they often act under moral rather than legal authority. They consider "these powers generally are fairly ample, flexible, and sufficient," though at the same time admitting, in the hands of another authority, more extensive powers might react to the public benefit. These undefined powers the police themselves do not desire to possess, since they might, in their opinion, possibly bring them into conflict with existing interests, or with certain sections of the public, and so affect the goodwill under which the police mainly carry out their general duties.

The Board of Trade interprets its main duty as "securing the safety of the public in connection with transport undertakings," a vague phrase which, unless an accident occurs, merely covers the initial inspection of railways, tramway lines, and rolling stock, but takes no account of the methods under which use is made of them by the operating companies so long as certain standardised conditions of running imposed by Parliament are observed. The London Traffic Branch of the Board of Trade closed on June 30, 1916.

The London County Council possesses the right to operate tramways, but cannot develop its system without express Parliamentary sanction, and it finds that while there is no traffic authority to co-ordinate or direct, and few authorities willing to put forth individual energy in the provision of public transport, there are many always ready to take up a position which might be helpful but which is usually the reverse. Invariably their action is essentially local and pays no regard to the requirements of Greater London as a whole.

Wasteful and Overlapping Competition.

Not a solitary witness has suggested that the present state of affairs is desirable, or that it does not imperatively demand an immediate and drastic remedy. To the discovery of this remedy your Committee have devoted their efforts. The Committee therefore put in the forefront of their report as the paramount recommendation which governs the entire utility of their work, the immediate creation of a supreme Greater London Traffic Authority. They recommend its establishment, not as a step which may be taken when opportunity offers, but as a vital measure of the most immediate necessity.

Witnesses have expressed the view that the immediate congestion during what are termed the peak-load hours is due to lack of adequate transport facilities arising out of war conditions. The Committee do not accept this in its entirety. Every transport authority asserts there is wasteful and overlapping competition on the part of its rivals, and every authority is more concerned in maintaining its present financial position and safeguarding its future prospects than in taking, by agreement, measures which would go very far to remedy the present undesirable condition of affairs. Indeed, apart from the statements of witnesses, this was admitted in a series of private negotiations between the London County Council and the General Omnibus and Associated Companies, held in 1915-16, when failure to reach an understanding on the co-ordination of transport services was due solely to an inability to agree over the creation and division of "the fare pool," and on the future preferential position of both parties as against the intervention of other transit undertakings.

Prompt action in the Committee's opinion can alone avert much public inconvenience and suffering, and even mortality this winter. In wet, cold, and inclement weather uncovered outside seats are only suitable for strong people, and long waits at street corners for a vacant place in over-crowded conveyances are a frequent cause of illness. There are moreover vast essential improvements which only an efficient and enterprising traffic authority can carry out over a period of years. Had the recommendations of the Royal Commission of 1905 been accepted London would not at this time be so helplessly exposed to the shortcomings and defects of which there is universal complaint. Even now enough can be done if there be no delay to guarantee the community against immediate ills, which must otherwise continue to increase. The Committee therefore assume, in all the advice tendered hereafter in regard to remedies for congestion of traffic, that a supreme traffic authority will be immediately called into existence.

Definition of Supreme Traffic Authority.

In the Committee's view, the time has passed when such an authority can be merely consultative or advisory, as recommended by the Royal Commission of 1905. Few of the local bodies agree in respect to positive recommendations. The County Council suggests that it should be elective and take over the Traffic Department of the Council, and also deal "with other things," an instance of the mental confusion which is characteristic of so many points of view in this controversy. The Underground Group of Companies otherwise known as the "Combine," recommend as practically inevitable "a Central Control" to deal with all transport, including main line railways, but object to this "Central Control" being invested with power to fix fares, or to give orders in detail, unless it assumes financial responsibility. The outer County Councils favour a Board of Control, but with dominant municipal influence based on some form of popular representation. The Board of Trade is not hostile to a unifying governing authority of some kind, but, with the railway companies, it appears to have lost active interest in the question since the projected establishment of the Ministry of Ways and Communications.* The police view, as stated above, is that the creation of the new suggested authority would help them.

There can be no question as to the public point of view. London is faced not merely with the certainty of the present traffic arrangements becoming worse and worse, but with future schemes on the part of private interests which may form an extreme menace to its comfort, convenience, and prosperity.

Composition of the Proposed Authority.

It is therefore incumbent on the Committee to give in precise terms (omitting administrative detail) the composition, the powers and the functions of a Supreme Traffic Authority, such as they conceive them. It is considered that, owing to the multiplicity of public and other bodies involved, which might claim representation on an elected board, the principle of direct representation is inapplicable. They therefore recommend the establishment of a Greater London Traffic Authority on the following lines:—

1. Five members as a maximum, to be appointed by the Government from nominations submitted by:—The Home Office—one; Ministry of Ways and Communications—one; London County Council—one; Local Authorities outside the Administrative County of London—one; with an independent chairman to be appointed by the Government.

* The Ministry of Ways and Communications will have jurisdiction over tramways belonging to companies of private persons, but no jurisdiction over tramways belonging to local authorities. As regards omnibuses, where omnibus routes have been authorised by special Act of Parliament, in the hands of local authorities, the Ministry will have no jurisdiction, but so far as a local authority or a company applies to the Ministry for sanction to run omnibuses over a new route not authorised by statute, but under the provisions of Section 20 of the Local Government Emergency Provisions Act, 1916, the Ministry will have jurisdiction under Clause 3, Sub-section 4, of the Ministry of Ways and Communications Bill. The position is therefore exceedingly mixed.

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2. The chairman should regularly report the proceedings to the Secretary of State for Home Affairs, who shall answer for, and be responsible for keeping the House of Commons informed as to the work of the traffic authority.

3. The authority, so far as Greater London is concerned, should have transferred to it the powers at present exercised by any ministry or department in so far as these powers are necessary to efficient administration.

4. The authority should exercise its powers over the Metropolitan Police Area.

5. The authority should in particular deal with the following :—(i.) Prepare and keep up to date a general plan to which all London transit facilities should conform, and bring before the authorities concerned the necessary steps to be taken to secure improvements. (ii.) Report to Parliament on the compliance with such plan of every new scheme promoted. (iii.) Direct the co-ordination of the routes and services of existing means of transport, *e.g.*, tubes, suburban railway services, tramways, and omnibuses. (iv.) Administer the Hackney Carriage Acts. (v.) Approve all designs for any vehicles used for the transport of passengers, and any alterations thereto, and enforce regulations for the public comfort and convenience. (vi.) Initiate legislation for traffic improvement. (vii.) Make bye-laws for the regulation of all traffic. (viii.) Initiate and enforce remedial action in respect of all obstructions to street locomotion.

Examples : —(*a*) Breaking up of streets. (*b*) Selection of routes for all vehicles. (*c*) Control of speed of differing vehicles. (*d*) All other obstructions to street traffic. (*e*) The provision of subways at congested points if deemed necessary.

To sanction :—(*a*) Stopping places for tramcars, omnibuses, cab ranks, etc. (*b*) Omnibus and tramway queues. (*c*) Entrances, exits, and platform accommodation on tube railways.

The Committee point out that apart from purely administrative expenditure, which by reason of the national and imperial character of London ought, in their opinion, to be borne by the State, no funds will be required, since in its initial stages the traffic authority will not possess the power either of carrying out broad schemes of improvement itself or imposing them on others, except through the operation of Parliament. Each member of the board ought to be paid for whole-time service.

Evils and Causes of Congestion.

Under the terms of reference your Committee were instructed to investigate the existing congestion as well as the increases of fares, with a view to making recommendations for remedial and immediate action in any directions possible. It is no exaggeration—having regard to the evidence—to describe the existing congestion as a scandal. Twice a day for a period of about two hours passengers are forced to subject themselves not merely to physical discomfort, but too often to actual physical suffering, in their endeavours in the morning to reach their places of business, and in the evening to return to their homes. The police recognised that the normal regulations could not be maintained, in view of the demand for passenger transport which attained such vast proportions in 1917, 1918, and in the early part of 1919. They, therefore, were obliged to make many concessions ; to permit overcrowding ; to waive the strict control they had hitherto exercised in licensing vehicles ; to interpret traffic regulations in face of existing conditions with the maximum of official good will. The only effective protest against unrestricted overcrowding seems to have come from the employees, who complained that they could not properly collect the fares

The unanimity with respect to many of the causes of congestion is remarkable. With the rest there was bound to be some difference of opinion, since they reflect upon the agencies whose policy made them possible. Thus every witness has been ready to attribute the congestion in some way or other to the war. Two chief causes were alleged, one being the withdrawal of rolling stock for the purposes of the Government, and the impossibility of replacing it, and the other the vast increase in the travelling requirements of the public due in the main to the calls made on all sections of the community for every form of war service. Towards the end of the war, new causes began to present themselves, which may play an increasingly prominent part in rendering the congestion worse. The legislation of the eight hours' day which may be carried into effect before the winter, and which has already been introduced into many trades by agreement, will have the effect of making the hours of labour of those engaged in purely industrial pursuits coincide with the hours of those employed in other grades of commercial life The congestion, which is at its worst in the morning between seven and nine-thirty, and in the evening between five and seven, will thereby be rendered more serious unless proper precautions to provide remedies are taken well in advance. The solution of the housing problem largely depends upon the provision of adequate traffic facilities. Ordinary economic forces must inevitably tend to compel people to reside further and further away from the centre of London. An eight hours' day will give them longer time for leisure and will stimulate the growth of the allotment and garden movements. Higher rates in the centre of London will operate to the same end.

Functions of Transport.

After setting forth in detail the existing means of transport the Committee dealt with the functions of transport. On this point, the evidence taken has been characterised by a regrettable absence on the part of all Government departments or local authorities or transport agencies of a broad view of public requirements, of a realisation that the Greater London traffic problem is one indivisible whole, of a real conception of the properly co-operating roles of varying kinds of transport in the life of the community.

The question of the most useful means of transport, in dealing with peak-hour traffic, shows an extraordinary difference of opinion Witnesses put forward diametrically conflicting views, some preferring railways and others tramways. The "Combine," while not overlooking the work of the tubes, the congestion on which would "be met by the new programme of construction," thinks it can "with the motor omnibuses certainly cope with the whole question of congestion in London without any difficulty, assuming unlimited construction and employment of the new 46-seat capacity vehicle."

In the face of so much conflicting evidence on the methods of operation a supreme traffic authority is essential to enforce a working scheme between all the services, in which the only consideration will be the maximum of convenience and comfort to the public, consistent with the reasonable financial requirements of each operating concern.

Such an authorised working scheme would eliminate competition and ignore the claims of an operating organisation to preferential treatment. There is no ground whatever for the acceptance of the "Combine" view that their surface activities merit, at least so far as omnibuses are concerned, any special franchise, and certainly not a monopoly, and their antagonism to London County Council (and presumably any other) development, either in respect of tramway extension or omnibus running, would not be entertained by any executive authority which aimed at making London transport effective and efficient, and which might fitly issue an authorisation to the County Council to run omnibuses should it wish to do so. It is very necessary, in the opinion of your Committee, to lay stress on this point, because all the "Combine" evidence tended to show that its operations are aimed at "pegging out claims" which one day may be put forward as vested rights.

Street Traffic Needs.

The police, except in the City, as already stated, do not possess adequate powers to regulate traffic. It is therefore clear that all vehicular traffic—goods as much as passenger—would greatly benefit by the existence of a supreme traffic authority with adequate powers of regulation and control No others are of use. Such powers could be exercised in many helpful directions. Thus the evidence has shown the need for :—

(1) Regulation of routes, both of passenger and goods traffic, which would entail the use of side streets whenever possible for slow-moving vehicles.

(2) Restriction of up and down traffic in narrow streets, as in the City, by the selection of separate routes.

(3) Better control of all cross traffic, and of both slow and fast traffic.

(4) Systematisation of road repair, much of which, especially in the main streets, should be carried out at night, or at such times as would best meet traffic conditions.

(5) Regulations for the breaking-up of the streets for the laying of gas and water mains, sewers, electric light cables, telegraph and telephone wires, etc.

(6) Arrangement for stopping places for omnibuses, as well as for tramway cars.

(7) Formation of queues at all heavy traffic points.

(8) Restriction of competitive services along the same routes.

(9) Regulation of all street obstructions, permanent, periodical (see 4) and moveable.

(10) An increase of the speed limit for trams as well as omnibuses.

(11) The linking-up, so far as practicable, of tramway dead-ends *e.g.*, Farringdon Street and Blackfriars, Vauxhall Bridge Road and Harrow Road.*

(12) The granting of powers to any municipal authority to own and operate omnibuses in their area.

Larger Issues of London Traffic.

The larger issues of London transport cannot be ignored, and must be faced and solved by those who will assume supreme control. To a considerable extent they involve expert engineering problems.

One reform which does call urgently for attention is the existing system of carting goods through the crowded streets at all hours of the day ; also heavy merchandise delivered from the docks to railway stations by vans, which could be better transmitted by rail if the necessary connections were used or made. The Committee cannot pass from this without pointing out that the present generation has seen but one new bridge constructed across the river, namely, the Tower Bridge, and that in London from the Tower to Hammersmith—a distance of ten miles—there are only 11 vehicular bridges, whereas in Paris within the walls of the city—a distance of seven miles—the Seine is crossed by 23 bridges.

* The Bill of the London County Council promoted this session in Parliament for the linking up of the north and south tramways, which was strongly recommended by the Royal Commission of 1905, was rejected by the Standing Orders Committee of the House of Commons because of the fact that the local authorities concerned had vetoed its promotion under Standing Order No. 22. There can be no more glaring case of the inexpediency of the veto than this. As a result Parliament was deprived of the opportunity of considering the scheme.

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In this connection your Committee notice the interesting, if controversial, suggestion made by the Walthamstow tramway manager to the effect that his Council would undertake the necessary street widenings for tramway extension if they could be guaranteed against omnibus competition which might deprive them of the revenue essential to pay for the large capital outlay. A supreme traffic authority should certainly consider and decide on any such proposition, under which the local authority should be held responsible for coping with all demands for transport facilities, since it would acquire what would be practically a monopoly. Your Committee, indeed, consider that local authorities insistent upon better transport facilities from third parties must face the question of themselves giving financial assistance to new schemes.

Rise in Fares.

The criticism of the existing high fares introduced in connection with all means of transport in London is largely attributable to inability on the part of the public to understand the principles upon which they are levied. Voluminous evidence has been laid before the Committee designed to show that the charges are inevitable, that they are relatively not excessive, and that they are not more than are warranted by the labour and other conditions under which the respective undertakings are carried on to-day. On this there is a measure of surprising agreement between the competing organisations, though such surprise is largely discounted by the apparent fact that the upward movement of fares is, if not concerted, at least very sympathetic. Indeed, the history of the London County Council tramway undertaking shows that while public opinion—or the fear of it—has tended to keep the fares down, even to the detriment of the working of the concern as a whole, an increase by any one authority is followed by similar action on the part of the others.

In view of the evidence laid before your Committee it is fair to admit the claim of both the tramways and the "Combine" to make some increase in their fares, so long as it is accepted that actual capital is entitled to a reasonable return on its outlay. The guiding principle which seems to have actuated the "Combine" in its raising of fares was to charge each particular passenger as much as he could be expected to pay; the County Council proceeded on the basis of reducing the penny distance to the minimum compatible with raising the sum of money needed, in its opinion, to meet all its liabilities. As a result, there is not the slightest effort at uniformity of fares, save under the stress of competition, and anomalies have come into existence which are difficult to justify, and should be remedied. The Committee have come to the conclusion that while some increases of fares were inevitable these are now in some cases far too high, while the general financial policy which renders them necessary is open to question.

In your Committee's opinion some reform is possible and might be tentatively introduced into the working scheme of a concern which admits that while its vehicles are utterly congested at certain periods of the day when enforced use is made of them by the public at specified fares, at all other times, when traffic is largely dependent on good will towards the opportunities offered, the same vehicles are compelled to run—if official statistics are to be accepted—at a dead loss. The Committee would have supposed that the elasticity in respect of fares found to be of the utmost value in provincial cities would have been more appreciated in London. Nor do they approve the system followed by the "Combine" in varying autocratically fares according to particular districts. This is a principle which has never been officially recognised in traffic control in this country, and your Committee hope it never will. It has led to unfair discrimination as against certain districts in which, quite as much as at home, the workers are obliged to travel, and the argument that it is aimed at the well-to-do is, in their opinion, puerile.

The Committee are quite aware that the official answer of all the transport agencies to criticisms of fares is that the "average" works out quite fairly for the public. In your Committee's opinion this "average" system can be used to correct self-created anomalies, to cover up inefficiences of working, to meet loss on experimental operations, which under present conditions ought not to be permitted.

The first duty of a supreme traffic authority would be not solely to see whether the sum of money raised by the increases of fares was adequate for the purpose of meeting legitimate liabilities, or claims, but whether it was properly raised, whether having regard to all the machinery of the undertaking it was rightly, justly, and necessarily raised. Attention should be immediately paid to this question by the supreme traffic authority.

There remains another important matter with which the Committee deal elsewhere, viz., the criticisms which can be and should be directed towards what one may call general policy in respect both of the London County Council and the "Combine." There is much which no authority having power and energy could have possibly approved had it existed in the past seven years. Matters of this nature affect primarily errors of omission rather than commission, but your Committee are inclined to believe that to them must be attributed not a little of the heavy charges which are now being placed on the community, while they are decreed as inevitable owing to the operation of causes over which London County Council and "Combine" alike maintain they have no control. No doubt increased charges would in any event have been necessary, but they neither ought to have been, nor ought to be, as heavy as they are.

Aspects of Municipal Policy.

The County Council evidence has not failed to convey the impression that it has always felt it was fighting a losing battle in respect of tramway promotion and extension. No doubt divided counsels have been largely to blame for this. The whole undertaking has provided a ground for bitter municipal polemics which are largely responsible for the troubles of the management, though it should not be overlooked that in the tramways the Londoner possesses an asset which, unofficially but with considerable accuracy, may be valued at 16 millions sterling. The Council has too often vainly evolved scheme after scheme of extension, and the Committee feel that very few have been treated with that measure of consideration they have deserved. It is therefore obvious that unless this campaigning against perfectly reputable and justifiable ideals is promptly modified no real reform in London traffic as a whole can be anticipated.

The Committee further consider that it is essential that there should be equal financial treatment of all surface means of locomotion which exist by an appeal to passenger traffic. They regard the rating of the tramways and their contribution towards the maintenance of the surface of the roads, as compared with the immunity of the omnibuses from both these charges, as indefensible, and there are, in their opinion, no counterbalancing considerations of sufficient magnitude to induce them to modify this view. Specific means of dealing with this problem would be one of the duties entrusted to the suggested traffic authority for recommendation to Parliament.

The Committee do not, however, consider that some aspects of the policy of the County Council are such as commend themselves. It is not characterised by either as much foresight or as much progressiveness as one would expect. There was hardly sufficient foresight in the provision of rolling stock, either before the war, or even during it. It is indeed surprising that in view of the still more acute congestion anticipated in the coming winter the Council should still, according to the evidence tendered, have ordered no new cars since the armistice, but rely apparently on the repair of the old ones to meet the public demand for transport. In this connection the tramway general manager admitted that "1,500 cars would clear the congestion at the present time"—a statement which we chronicle without accepting—and yet remarked that "it would be rather overdoing it to run this number at the present time."

The Committee notice that sufficient power exists to run this full number of cars; they would like to feel that the Council is, in this respect, looking not merely a little but far ahead. Much evidence has, too, been given regarding the regulation and control of tramway traffic, and while the Committee appreciate the difficulties it is inclined to the view that reforms could be introduced, and probably would have been introduced but for the curious apprehensiveness which seems to be entertained by the officials of the department as to the results of experimental working, which would speedily show their value or the reverse.

Omnibuses and Underground Railways.

The Committee appreciate the value of omnibus transport to London, but all experience, notably of the last few years, demonstrates the urgent need for a regulating authority to deal with these vehicles. Such evidence, too, as they have heard does not convince them that the "Combine" in the last year of the war and after the armistice might not have advantageously to a large extent supplemented its existing vehicles from other concerns than the Associated Equipment Company, which is really part of their own organisation. The Committee do not accept the suggestion of the "Combine" that the existing congestion is largely due to lack of rolling stock, if by this it is contended that the shortage alone, as compared with pre-war supplies, is solely responsible. Moreover, the relations of the "Combine" and the police in respect of the suitability of omnibuses—merely to mention one instance of several—seem to be productive of delay in the provision of up-to-date vehicles, although the whole system of police inspection and licensing of omnibuses is archaic, unbusinesslike, and utterly subversive of progress. In face of present conditions it is regrettable that the "Combine" have been for two years experimenting to produce a post-war omnibus which the police would pass, and yet at present not one of the new type is on the streets.

As regards the Underground Railways under the control of the "Combine," there is much the Committee wish in all fairness to eulogise. But they do not consider that the actual running of the trains is in accordance with the schedules. No real incentive for reform exists so long as the most scandalous overcrowding, so far as any remedy is concerned, is left to the "Combine" itself.

It is, in view of the recent drastic changes, too early to speak with confidence regarding the "Combine" tramways, but the explanations regarding the shortage of rolling stock do not appear wholly satisfactory, in view of the number of cars actually possessed. The running of both "Combine" omnibuses and tramcars on the same routes is a practice which, from the public standpoint, is indefensible.

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Having invited the public to suggest possible improvements in dealing with the congestion of traffic, the Committee feel that they must put on record their appreciation of the vast response which has been made. Many recommend that omnibus companies should be compelled to introduce workmen's tickets. The Committee approve this course, particularly since in the abortive negotiations with the London County Council in 1915-16 the "Combine" accepted this principle.

The Committee conclude their report as follows :—

SUMMARY OF RECOMMENDATIONS.

Congestion.—The immediate creation of a Supreme Traffic Board for Greater London. Radius :—Metropolitan Police Area. Membership :—Five—as a maximum. Powers :—All those now possessed by existing bodies or conferable by Statute. Authority :—Executive, with right to delegate where desired. Special functions :—To co-ordinate routes and services of all systems of transport, regulate all traffic and street repairs, be responsible for the comfort and convenience of the public, provide for future developments, and promote legislation to desired ends.

Fares.—While some increase was inevitable in view of post-war conditions, the new fares are in cases excessive, in others unjust, and too manipulated to be understood by the public. Greater uniformity is essential and anomalies must be eliminated. The policies entailing such increases are open to criticism. The fares for taxi-cabs should be raised to 1s. for the first mile, with 3d. for each subsequent quarter of a mile. Increased fares outside the Central Area.

THE UNDERGROUND GROUP'S REPLY TO SELECT COMMITTEE'S REPORT.

The following statement has been issued on behalf of the Underground Group of Companies :—

The report makes many allegations, but all of a general character, and advances no specific evidence in support of them. It is therefore quite impossible to furnish a specific answer. It will, we think, be seen, when the evidence taken by the committee is published, that many of the allegations cannot be supported by the facts given. They would rather appear to rest upon the opinions and impressions of certain members of the committee. Until the proceedings of the committee are published, it is impossible to see how far the members were unanimous in their report. It would therefore seem desirable to defer final judgment until all the necessary information is available.

On the question of fares the report itself supplies the answer to the allegations that the Underground Group of Companies has made unreasonable increases. The average dividend on the capital employed is stated on page 7 of the report to be 2·93 per cent., and on page 11 it is accepted that "actual capital is entitled to a reasonable return on its outlay." Surely less than 3 per cent. is not a reasonable return. No other decision would seem to be possible, having regard to the fact that a distinguished accountant, Sir Arthur Whinney, nominated by the Home Office, had, after a complete investigation of the books of the L.G.O. Company, stated : "The conclusion is therefore arrived at that up to the end of the year 1918 the increase in fares charged to the travelling public by the Company is fully justified by the increased working costs."

The primary recommendation of a Central Controlling authority for London traffic is a right and proper thing, and has always been supported by the Underground Group of Companies. The exact form of that controlling authority as recommended by the committee is open to manifest objection. In particular, the London County Council, as the body responsible for the actual conduct of the tramway system in London proper, is hardly entitled to sit in judgment upon traffic questions. While it is admitted that the proposed Ministry of Ways and Communications is, as regards London traffic, in a position that is exceedingly mixed, as it is now becoming an accomplished fact, it would seem desirable to devote some attention to clearing up that position as the easiest solution. The Underground Group of Companies has, however, no definite scheme of its own for a Traffic Board, and would accept any independent and impartial tribunal.

TRANSPORT POWERS FOR THE FOOD CONTROLLER.

An amendment to the Defence of the Realm Regulations, published in the *London Gazette* on August 1, gives the Food Controller powers to exercise any of the regulations which have conferred powers on the Board of Trade to provide an efficient system of road transport where it is considered necessary, to impress at a moment's notice, sell, or purchase horses and vehicles, to prohibit or restrict the carriage by road of any particular class of goods, to regulate the routes for vehicles and questions of priority, and to demand returns from owners of horses and vehicles. The object of the new regulation is to enable the Controller to encourage or maintain the food supply of the country or secure proper distribution of stocks.

PERNAMBUCO TRAMWAYS AND POWER COMPANY.

ANNUAL MEETING.

The seventh ordinary general meeting of the Pernambuco Tramways and Power Company, Limited, was held at the offices of the company, River Plate House, E.C., on August 7, Mr. Follett Holt, M.Inst.C.E. (the chairman of the company), presiding.

The secretary (Mr. H. Tattam) read the notice convening the meeting and the report of the auditors.

The chairman, in moving the adoption of the report and accounts, said that the year 1918 proved to be a very difficult period. During the last year of the war, as they knew, the shipping situation became acute, and prices for fuel and all materials became exorbitant, and the difficulty of obtaining them at any price was intense. It was satisfactory to report, however, that throughout that troublesome period they were able to keep the whole of their service going, and did not close down in any department for a single day. The gross revenue of the company continued to expand, and it was interesting to note that it had almost doubled during the last four years. Unfortunately the high prices of fuel and stores swallowed up the whole of their gross increase last year, although their net balance would have been considerably better if it had not been for a particularly violent attack of influenza, which had a paralysing influence on their tramway receipts for nearly two months.

Their total net receipts were about the same as in the previous year, and after transferring £10,229 to the capital reserve account, £10,000 to renewal and reserve account, and £1,500 to amortisation account, the directors were able to recommend a dividend of 3½ per cent. on the preference shares. They were not very satisfied with this result, and he hoped that they would never again have to combat with such difficulties as they met with during the last four years. They had still to face the aftermath of war, with its labour troubles and high prices, so that they could not afford to be optimistic at present, but the directors were confident that the company would prove to be a successful concern when they got back to anything like normal times. He was glad to be able to report that the telephone company, in which they had a substantial interest, was making good progress and now gave them a return on their investment. The telephone concession required revision, and when that had been brought about they would endeavour to give Pernambuco a first-class telephone service, and certainly, he hoped, a better one than that which we were supposed to enjoy in London, the greatest and richest city in the world. The negotiations for the revision of their telephone concession and other matters would fall to their good friend and able colleague Mr. Gudin, who had recently come over from Pernambuco to consult with them on the affairs of the company. The extension of their tramway concession by ten years was the principal change incorporated in the new contract, but they must remember that this and other improvements rendered it imperative when funds permitted for them to comply with their obligations to the State Government under the contract.

NEW CAPITAL TO BE RAISED.

To complete their system they would require more capital, and after consulting with their French and English financial friends they had decided as a first step to ask the shareholders to-day to give them powers to raise money on security ranking after that of the company's debentures. When the shareholders had given these powers the board would endeavour to obtain the sanction of the Treasury to an issue of capital to be made to the present share and debenture holders. As a board they considered that the development of their lighting system and other works urgently called for under their concessions would fully justify the employment of the additional capital they proposed to raise. Their gross revenue from the whole of the undertaking for the current year showed a substantial further increase, but expenses were still on the high side, and this year might not show any marked improvement in the net results. But the quick development of their lighting and tram business which would be brought about when they had the capital necessary to deal with it would help them to produce in the near future better results.

Mr. Herbert K. Heyland seconded the motion.

Mr. H. W. Henderson said that he had recently returned from a visit to Pernambuco, and he was very pleased indeed with what he saw of the working of the company. The only thing needed to make it a real success was to finish the job. He cordially supported the raising of fresh capital to do this.

The motion was put to the meeting and carried unanimously.

A dividend of 3½ per cent., less income-tax, on the 7 per cent. non-cumulative participating preference shares for the year ended December 31, 1918, was declared, and the retiring directors and the auditors were re-appointed.

A resolution was also passed giving the directors borrowing powers to the extent of £500,000 over and above the amount at present authorised. The proceedings then terminated.

Protection for Upper Deck Passengers.—The manager of Walthamstow Council Tramways has been notified by the Police Commissioner that in future open deck tramcars will not be licensed unless upper deck seats are provided with suitable waterproof knee aprons.

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FINANCIAL REPORTS AND MEETINGS.

HONG KONG TRAMWAY COMPANY have declared an interim dividend on account of the year 1919 of 9d. per share.

HADFIELDS, LIMITED, have declared an interim dividend of 6d. per share, free of income tax, on the ordinary shares.

SWANSEA AND MUMBLES RAILWAY.—An interim dividend of 9⅜ per cent. per annum (7s. 6d. per share), less tax, is announced on ordinary shares for the half year.

BRISTOL TRAMWAYS AND CARRIAGE COMPANY.—An interim dividend is announced for the half year ended June 30 last, at the rate of 3 per cent. (free of income tax) on ordinary shares.

DUBLIN UNITED TRAMWAYS.—An interim dividend for the half year of 5 per cent. per annum (5s. per share), less tax, has been declared on ordinary shares. A year ago the rate was 4 per cent.

STEWARTS AND LLOYDS, LIMITED.—An interim dividend is at the rate of 6 per cent. per annum on the preference shares, and of 10 per cent. per annum on the ordinary shares for the half year ended June 30 last.

LIVERPOOL OVERHEAD RAILWAY COMPANY.—The directors have declared interim dividends for the half year ending June 30 at the rate of 5 per cent. per annum on the preference shares, and 2½ per cent. per annum on the ordinary shares.

AYR CORPORATION TRAMWAY RECEIPTS for the week ended July 26 broke all records. The number of passengers carried was 260,000 and the receipts amounted to £2,093. The record for a single day was £385, or £70 more than the previous record.

WEST HAM TRAMWAY LOSSES.—The net revenue account for the year ended March 31, 1919, shows a deficit of £7,703. The reserve and renewals funds have been exhausted, and all future expenditure for renewals, which must be heavy, will be a charge upon the rates. The loss for the past year included sums paid as allowances to men on active service. The borough treasurer states that if it were not for these payments there would have been a profit of £7,739.

THE UNDERGROUND GROUP.—The following dividends have been announced :—

LONDON ELECTRIC RAILWAY.—On the 4 per cent. preference stock, 2 per cent., on the ordinary shares 1 per cent. (being at the rate of 2 per cent. per annum, which is the same rate as 1918).

UNDERGROUND ELECTRIC RAILWAYS.—On the 6 per cent. income bonds 3 per cent., free of income tax.

CENTRAL LONDON RAILWAY.—On the undivided ordinary stock of 2 per cent. at the rate of 4 per cent. per annum (which is the same rate as 1918); on the preferred ordinary stock 2 per cent

CITY AND SOUTH LONDON RAILWAY.—On the 5 per cent. preference stock 2½ per cent., on the ordinary stock of 1 per cent. (being at the rate of 4 per cent. per annum, the same as for 1918).

LONDON GENERAL OMNIBUS COMPANY.—An interim dividend on the ordinary shares for the half year ended June 30 last of 4 per cent., free of income tax.

ENGLISH ELECTRIC COMPANY, LIMITED.—The recent offer of a final issue of £1,111,100 sinking fund 5½ per cent. mortgage debentures of the English Electric Company, at the issue price of 94 per cent., marks the completion of an important amalgamation. The company was formed in December last with a capital of £5,000,000, and is an amalgamation of five well-known undertakings, the Coventry Ordnance Works, Dick, Kerr and Company, the Phœnix Dynamo Manufacturing Company, the United Electric Car Company, and Willans and Robinson, whose average net profits for the past four years amount to £338,400 per annum. The net surplus of all fixed and liquid assets over all liabilities is £2,309,732. Since the armistice orders amounting to £1,500,000 have been secured, and with the combined resources of the individual concerns the group will undoubtedly form a very important factor in electrical engineering development. It is expected that the export business will continuously expand, and when fully organised the works will be capable of turning out orders to the value of between three and four million pounds per annum. The joint managing directors, Colonel Sir John Herbert Mansell, Mr. Percy Pybus, and Mr. Walter Rutherford anticipate that there will be no difficulty in filling the order books of the company.

BRITISH ELECTRIC TRACTION COMPANY.—Mr. Emile Garcke presided at the twenty-third ordinary general meeting of the British Electric Traction Company, Limited, on July 3. In moving the adoption of the report, the chairman said that the accounts showed a revenue of £250,213, or £12,308 more than for the preceding year. On the other hand, the expenses were £36,889, or £8,205 more. Including the balance brought forward of £112,116 and deducting debenture interest (£90,449), there was an available balance of £234,991. They had placed £21,486 to reserve, and proposed to pay £82,552 in dividends, viz., 6 per cent. for the year on the preference stock and 3 per cent. on the ordinary stock, the same rates as were paid for the preceding year, and to carry forward £130,952 to the next account. On the whole of their investments for the past year the average yield had been 5·08 per cent., against 4·93 per cent. for 1917. The prospects for the present year were good in some respects, but uncertain in others. The question of fares on the tramways and omnibuses, and of charges for electricity had always been a vital factor of their business. However much they might economise, their efforts could only inadequately compensate for the depreciation in the purchasing value of the penny when applied to the payment of wages and the purchase of material. The chairman referred at some length to the Ways and Communication Bill and the Electricity Supply Bill.

BELFAST CITY TRAMWAYS.—The actual surplus for the year ended March 31, 1919, was £29,230, which creates a record for Belfast. This is greatly in excess of the previous highest result, which was obtained in 1912. If the fares and stages at present in force had been in operation a full twelve months it is estimated that the revenue would have shown an increase of £111,000, or a total of £466,000 for the year. The general manager, Mr. J. S. D. Moffet, estimates that the revenue is £516,000. The summary appended, which compares the results for 1914 with those of previous years, shows the remarkable improvement that has been effected.

Year ending March 31 ...	1919.	1918.	1917.	1916.	1914.
	£	£	£	£	£
Total revenue	406,301	355,056	301,345	284,653	272,062
Working expenses —					
Traffic	121,218	102,582	82,115	74,589	77,949
General	29,207	25,678	23,876	23,159	12,583
Repairs and maintenance	52,449	43,031	36,014	28254	41,455
Power	54,289	50,676	47,660	33,308	28,281
Total working expenses ...	257,163	221,967	189,665	159,310	160,278
Gross profit	149,138	133,089	111,680	121,343	111,784
Interest	50,549	50,549	50,501	48,352	48,342
Sinking fund	43,509	42,882	43,937	41,396	40,315
Income-tax and sundry charges	8,850	4,221	7,134	6,554	3,223
Depreciation	17,000	17,000	17,000	17,000	17,000
Surplus	29,230	18,437	6,892 *(Deficit)	7,861	2,904
Track mileage	100	100	100	100	100
Car mileage	5,254,482	6,279,072	6,245,012	6,077,658	6,865,591
Passengers carried	74,594,051	75,416,816	69,582,066	64,697,292	63,131,828
Total revenue per car-mile ...	18·56d.	13·57d.	11·58d.	11·08d.	9·51d.
Average number of passengers per car-mile	14·19	12·01	11·14	10·65	9·19
Energy consumption (units)	8,878,855	10,249,611	10,077,955	10,080,540	11,000,708

* This deficit of £6,892 in 1917 was charged against the surplus of £18,437 for 1918.

CONTRACTS AND ORDERS.

The Auto-Ticket Printing Company, of Liverpool, have received an order from Bradford Corporation for the supply of tramway tickets for a period not exceeding three years.

J. W. Courtenay, Ltd., Amberley House, Norfolk Street, London, W.C., have been appointed sole advertising contractors to Exeter Corporation Tramways.

British Rails for Ipswich.—Ipswich Corporation propose to buy British steel rails. An American offer was made of £16 15s. per ton with shipment in August. Only one British firm tendered, and the price was 15 per cent. higher than the American offer.

Sandberg's "Insitu" Treatment of Rails.—Messrs. Scholey and Company, Limited, 56, Victoria Street, London, S.W.1, the licensees and contractors for this patent process for increasing the durability of existing tramrails "in situ," have obtained a repeat order for the treatment of the rails on two miles of single track of Bournemouth Corporation Tramways. Up to the present time, contracts have been made with the following undertakings :—Croydon, London (Metropolitan), Manchester, Birmingham, Bournemouth, Liverpool, Glasgow, Sheffield, Leeds. Repeat orders have been given by Croydon, London (Metropolitan), Manchester, Birmingham, and Bournemouth.

More Steel Rails from U.S.A.—The London United Tramways, Limited, are relaying about seven miles of double track on the Hammersmith to Brentford and Acton to Hanwell routes, with 2,500 tons of rails supplied by the United States Steel Products, Limited, at a price, including delivery, of approximately £40,000. Five hundred tons have been received and about three-quarters of a mile of track at Chiswick has been relaid with the new rails. Mr. C. J. Spencer, general manager of the London United Tramways, Limited, has stated that although six British firms were asked to tender for the required rails, only one was in a position to do so. The one tender received was not greatly in excess of the American firm's tender, but it had clauses which would have enabled the contractors to raise the amount of the tender in the event of the cost of labour increasing. In view of labour conditions they were also unable to promise delivery on a definite date. The Americans were able to offer a superior quality of steel and a firm contract. Birmingham and Glasgow Corporations recently placed orders for rails with the United States Steel Products Company, Limited, for early delivery.

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PERSONAL.

Mr. Archibald Page has been appointed general manager of the Clyde Valley Electrical Power Company.

Liverpool Tramways Committee propose to appoint Mr. C. Birchall as motor garage foreman of the tramways department at a salary of £300 a year.

Mr. Edgar Maxon, deputy electrical engineer and manager, Blackburn, has been appointed to be electrical engineer of South Shields. There were over forty applications.

Mr. Johnstone Wright has been selected for the position of chief assistant electrical engineer to Bradford Corporation. The salary is £750 per annum. There were 139 applicants.

Mr. Kennedy Jones was entertained at dinner on July 30 by the members of the Select Committee on London Traffic, in recognition of the manner in which he discharged his duties as chairman.

Mr. Wm. Debney, chief assistant to Mr. Chas. Brownridge, Borough Engineer, Birkenhead, has accepted an important appointment on the staff of Messrs. C. P. Sandberg, Consulting Engineers, Westminster.

Mr. W. E. Lorkin has been awarded the silver medal of the Society of Arts for his paper on "Electric Welding and Its Application." An abridgement of this paper was published in our issue of April 10, 1919.

Mr. Donald Sinclair, until recently resident engineer at Glasgow for the General Electric Company, has been appointed by the Chloride Electrical Storage Company, Limited, as their representative for Scotland and the English Border Counties.

Major Arthur C. Baker, who was assistant electrical engineer of the Birmingham Corporation Tramways, and enlisted early in the war as an air mechanic, has just returned to his duties. He was granted a commission early in 1917, and has been demobilised with the rank of major.

Sir Evan Jones, Bart, M.P., has resigned his position as chairman of the Road Transport Board. The main duties of the local organisation of the board are now concerned with transport for foodstuffs, and it was therefore incorporated with the divisional organisation of the Ministry of Food on July 31.

Mr. W. E Ireland, acting rolling stock superintendent in the London County Council tramways department, has been authorised by the Council to take out a patent for his invention for the ventilation of tramway motors, it being understood that the Council shall be allowed to use the patent without payment if desired.

Major F. B. Hills, D.S.O., has been appointed engineer and manager of Guernsey Electric Light and Power Company. Major Hills previous to the war was engineer and manager of the North of Scotland Electric Light and Power Company. He was mobilised in 1914, and commanded the Montrose Company, N.S., R.G.A.

Mr. T. P. Sykes, technical assistant of the Bradford Corporation Tramways, has been appointed general manager of Rotherham Corporation Tramways, subject to confirmation by the Council. Mr. Sykes, who is 37 years of age, and has served the Bradford tramways for 19 years, received his mechanical and technical training at Bradford Technical College.

Mr. J. Wilkinson, electrical engineer of Hull Corporation Tramways, has tendered his resignation, owing to ill-health. Mr. Wilkinson, in intimating to the Tramways Committee his desire to resign, expressed his regret at severing a connection lasting nearly twenty years, but his health had been failing during the past two years, and he felt he could not carry out his duties as he desired.

Mr. H. S. Banner, lately chief inspector of Southport Corporation Tramways,was on July 4 presented by Mr. T. J. Kendrew, general manager, on behalf of the officials, with a suitably inscribed silver cigarette case, and on the Sunday following, motorman J. Orme, on behalf of the employees, presented the ex-inspector with a clock, as a token of their esteem. In making the presentation, Mr. Orme said Inspector Banner, while performing his duty to the manager and the committee, had exercised a spirit of fairness, sympathy, and cordial co-operation.

Southampton Tramway Management.—Twenty-four applications have been received for the position of general manager and engineer of Southampton Corporation Tramways. The committee have recommended that four candidates be interviewed, viz., Mr. A. B. Slater, general manager, Burton-on-Trent Corporation Tramways; Mr. J. Dobson, general manager, Gravesend and Northfleet Electric Tramways Company; Mr. Charles Burgess, general manager and engineer, West Hartlepool Corporation Tramways; and Mr. J. F. Cameron, engineer and general manager, Northampton Corporation Tramways.

To mark the transfer of the Edinburgh tramways from the Edinburgh and District Tramways Company to the Edinburgh Corporation, the general manager of the Tramways Company, **Mr. J. R. D. Cox,** has been presented with a handsome silver tray. Mr. Robert Aitken, in making the presentation, referred to the pleasant relations which had constantly existed between the manager and the employees, and the sympathetic way in which Mr. Cox has always received representatives on their behalf. Mr. Cox remains for the present in the service of the Edinburgh and District Tramways Company.

At a recent meeting, Belfast Town Council passed a resolution granting **Mr. J. S. D. Moffet,** general manager of the tramways, a war bonus at the rate of 10 per cent. on the salary he received up to July 1, 1918, but making the bonus date from July 1, 1919. It seems that the Belfast Council considers Mr. Moffet to have been entitled to the war bonus in July, 1918, but fails to recognise that he ought to be paid the arrears due from that date. Instead the Council pays the bonus on the smaller salary and begins payment eleven months after it was due. Belfast Town Council is enjoying the most rare advantage of having it both ways.

London County Council Appointments.—The names of three candidates for the appointment as repairs superintendent of Greenwich power-station were submitted to the London County Council on July 22. This post was provided in the organisation scheme of the tramways department adopted some time ago. The three candidates selected by the Highways Committee were Mr. G. P. Henzell, assistant power house engineer, Wimbledon power-station, L. and S.W. Railway; Mr. H. Leigh, mechanical superintendent, North Metropolitan Electric Supply Company; and Mr. A. E. Scarborough, assistant resident engineer, Park Royal generating-station, Great Western Railway. On the recommendation of the Committee, Mr. G. P. Henzell was appointed. The salary is £300 a year, rising by annual increments of £20 to £400, together with a temporary war allowance of 20 per cent., plus £90.

COAL DISTRIBUTION IN 1917.

Mr. Bridgeman, in a written reply to Colonel Burdon, states that in 1917 the coal available for home consumption, after deducting the amount required for the operation of the coal mines, is estimated to have been distributed among the principal industrial and other uses approximately as follows:—

	Million Tons.
Mines (other than coal mines) and quarries... ...	2½
Railways for locomotive purposes	13
Gas works	18½
Electricity works	7
Blast furnaces	19½
Other uses in metal industries, including engineering and shipbuilding	30
Textiles	9
Food and drink...	3
Chemical and allied trades	5
Paper, printing, and allied trades	2
Building, clay and stone	6½
Miscellaneous industries	3
Domestic, mercantile, etc., uses, including coal used by the Admiralty and 1¼ million tons used for coastwise bunkering...	64
	183

THE INTERNATIONAL TRAMWAYS UNION.

ENLARGED BRITISH MEMBERSHIP DESIRABLE.

Mons. Henri Camp, secretary of the Union Internationale de Tramways et de Chemins de Fer d'interet Local (23, Rue d'Arlon, Brussels), was recently in London, and attended the conference of the Tramways and Light Railways Association. He hopes to encourage a large number of British tramway undertakings to become members of the union, which has resumed its activities after the war. The union has been reconstituted, and the membership is confined entirely to representatives of allied and neutral countries. At present the United Kingdom is represented in the membership only by the London County Council, the Manchester and the Leeds Corporation Tramways.

In view of the valuable work which the union has done for the tramway industry for more than a quarter of a century, it is to be hoped that many other municipal and company tramways will join and thus increase the British membership and influence. Hitherto the official proceedings of the union have been printed in German and French. In future the publication will be limited to the French edition, unless the English membership becomes sufficiently large to justify the considerable expenditure of printing the proceedings in English. The annual subscription is small, ranging from £2, in the case of those undertakings whose average receipts do not exceed £37,500, to £12 where the receipts exceed £187,500. Manufacturing firms and other companies, industrial associations, and persons interested in the tramway and light railway industry may also become associated or personal members, and the dues in these cases are almost nominal.

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TRAMWAY AND LIGHT RAILWAY NOTES.

BIRKENHEAD.

EFFECT OF INCREASED FARES.

The chairman of the Tramways Committee recently said that when fares were increased passengers decreased by 60,000 in the first week, but the decrease had diminished to 20,000, while the receipts had grown by £700 a week. The increase in fares was made necessary by the higher wages bill due to the eight-hour day and the six-day week, which required the employment of 40 more men. The annual wages bill had grown from £20,000 to £52,000. Twenty-four miles of single track and 65 cars are now controlled by Birkenhead Tramways Committee. The undertaking has so far cost £370,000, but in nine years it will be free from debt.

BRADFORD.

ABOLITION OF PLATFORM COLLECTIONS.

The Tramways Committee have recommended the discontinuance of the collection of fares on the car platform, owing to its unpopularity. In bad weather passengers have had to wait in the rain until the fares of persons in front have been collected, and the department has come to the conclusion that the system is a waste of time at intermediate stopping places. It would appear that Bradford has misunderstood the object of platform collections. Where the system is working successfully no attempt is made to collect a considerable number of fares on the platform. The object of the innovation was to deal with a few passengers only, say half a dozen, thus saving a considerable number of runs upstairs and enabling him to keep the platform—where the majority of accidents occur—under observation.

BARROW-IN-FURNESS.

The Corporation have resolved to take over the tramway undertaking from the British Electric Traction Company, which has run the service for a number of years.

BRIGHTON.

TRACK REPAIR LIABILITIES.

The Tramways Committee have reported that they will require to spend on the improvement of the tracks the sum of £10,000 per annum for the next seven years, in addition to the whole of the reserve and renewals fund, which now stands at £22,533. Of the profit balance of £5,092 for the last financial year, £5,000 has been transferred to the credit of the borough fund.

CARLISLE.

FIFTY PER CENT. INCREASE IN FARES.

Carlisle Electric Tramways Company recently put in force their announced intention of raising passenger fares all over by 50 per cent.

DUNDEE.

IMPROVEMENTS IN BREAKDOWN AND OVERHEAD EQUIPMENT.

The Tramways Committee have recommended that a motor car should be purchased as an auxiliary to the repair wagon, and that the scheme of Mr. Richardson, electrical engineer, for the improvement of overhead equipment, including a shorter trolley arm with a lighter head, should be adopted.

DONCASTER.

NEW CAR DEPOT AND ADDITIONAL CARS.

The Town Council have applied to the Board of Trade for power to borrow £26,000—intending to devote £21,000 of the amount to the purchase of ten additional tramcars, and the remaining £5,000 in the erection of a new car shed.

GLASGOW.

HALFPENNY FARES—CAR PERMITS FOR MEDICAL MEN.

The Corporation have again deferred a decision on the proposal that halfpenny fares should be abolished. It seems hardly possible, however, that the change can be long postponed. In response to a request by the medical faculty, the Tramways Department has issued a special permit to medical men allowing them to board cars which may be carrying a full complement of passengers.

KIRKCALDY.

COSTLINESS OF OLD REPAIRING METHODS.

In the report of the Kirkcaldy Corporation Tramways for the past year, it is stated that the track is being kept in repair by old methods. A welding plant has been ordered, and after the joints have been welded, it is hoped that the cost of repairs and upkeep will be considerably reduced.

LEEDS.

THE MARKET FOR SECOND-HAND CARS.

Leeds Corporation have sold eight cars to the Yorkshire (West Riding) Electric Tramways Company and six to Walthamstow Tramways. The average price is about £1,000 each.

LEICESTER.

DOUBLING OF TRACK AT LEICESTER.

The Tramways Committee have decided to convert the present single track on an important section of the system into a double track, at a total cost of £18,000.

LONDON.

AGREEMENT RESPECTING TRAMWAY CHARGES—LOSS ON ALL-NIGHT SERVICES—ACCIDENT CLAIMS—MEMENTO FOR WOMEN CONDUCTORS—EXTENSION SCHEMES.

An encouraging announcement concerning the administrative side of the tramways of the London County Council was made at a meeting of the Council at which the annual estimates were discussed. It was stated by Mr. W. H. Gordon, a member of the Highways Committee, that the principle had been definitely settled by the two chief parties that the tramways should not become a charge on the rates. They were also agreed that no unfair burden should be placed on the undertaking which would create what was really a fictitious deficit. A sequel to this statement was seen at the Council's meeting on July 29, when the committee presented a report dealing with the financial burdens the tramways have to bear. The aim of the committee was to institute a reasonable comparison between the position of the Council's tramways and that of other tramway systems, and of competing traffic undertakings. The veto of road authorities on the construction of new lines is also touched upon. The Committee recommended that application should be made to be relieved of the liability for the maintenance of the roadways in thoroughfares in which there are tramways, and that no part of the cost of street improvements be charged to the tramways, except when solely and specifically required for the working of the tramways. All-night car services are run on nine routes by London County Council. On a weekly car mileage of 1,470 miles the average receipts per car-mile are 6·19d., while the operating expenses exceed 14·72d. Judging by the number of accidents which occur in a quarter on the London County Council Tramways it would be profitable for the ratepayers if the authority instituted a Safety First Campaign for the public and the tramway employees. During the past quarter 719 claims in respect of accidents were settled, the total expenditure being about £3,717. There were 75 other actions against the Council. In seven of these the verdict was given against the Council, and £415 had to be paid. Eleven actions resulted in the Council's favour, the remaining cases being settled by negotiation. The utility of the quarterly reports would be enhanced if in future a comparison was made with the corresponding quarter of the previous year. As a mark of appreciation Walthamstow Tramways Committee are issuing to the women conductors a neatly printed brochure, containing a record of their services, signed by the chairman, Councillor Clarke, and the manager, Mr. W. Murray. After the summer recess the Highways Committee will present to the County Council proposals for linking up and consolidating the tramway system. The application to Parliament for powers to run omnibuses will also be presented again, in consequence of it having been submitted too late to be heard this session.

LIVERPOOL.

NEW SCALE OF FARES—CONVEYANCE OF CHILDREN TO PARKS—NEW CARS.

A resolution recently adopted by the Liverpool City Council, under which a passenger would be able to travel only one and a half miles for a penny instead of two miles as hitherto, has been carried into effect on certain routes. For instance, the fare from Sefton Park to the Pierhead is now 1½d. instead of 1d., and from Garston to the Pierhead 4d. instead of 3d. The Tramways Committee have sympathetically received a deputation from the Education Committee, which asked that facilities might be given for the conveyance of children from congested districts to the parks. It was pointed out that in certain of the schools there were children who had never been in one of the parks. The Education Committee propose to make a grant for the purpose if the Tramways Committee will convey the children at reduced rates. It is proposed to purchase 20 new cars in addition to those recently ordered. The cars will be of the standard type described in our issue of June.

SALFORD.

OBJECTION TO WOMEN CASH CLERKS.

Salford Corporation Tramway employees are insisting that the continued employment of women clerks at the cash receiving offices is contrary to the agreement between the committee and the Workers' Association—that all men who had returned from service would be reinstated. Mr. G. W. Holford, the general manager, says that women receiving clerks were not mentioned in the agreement, and that it had been the intention before the war to utilise women in this department, as is done in Manchester.

SWANSEA.

ADDITIONAL TRAMWAYS AND OMNIBUSES.

The Swansea Highways Committee have decided to seek Parliamentary powers for the construction of a new tramway from Morriston to Skewan, and to run motor omnibuses within and without the borough.

WEST HARTLEPOOL.

AN EXPERT'S PREDICTION.

Giving evidence before the House of Lords Select Committee appointed to consider West Hartlepool Corporation Bill, Mr. J. B. Hamilton, general manager of Leeds Corporation Tramways, gave it as his opinion that, in ten years, the routes proposed would form part of a service linking up the Hartlepools, Middlesbrough, Stockton, and Thornaby.

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DIARY OF EVENTS.

FROM TUESDAY, JULY 1 TO THURSDAY, JULY 31.

TUESDAY, JULY 1.

Celebration of the Semi-Jubilee of Glasgow Corporation Tramways.—Edinburgh Corporation takes over operation of the tramways from the Edinburgh and District Tramways Company.—Annual accounts, London County Council Tramways (1918-1919), submitted to Council showing, without any allowance for depreciation, surplus of £8,000 paid into renewals fund. A year ago the surplus was £95,500.—The Select Committee of the House of Commons appointed to inquire into the conditions of London traffic take evidence from Mr. H. E. Blain, operating manager of the London Traffic Group, and Mr. C. J. Spencer, manager to the Metropolitan Electric, London United, and South Metropolitan Electric Tramways Companies.—Blackpool Council increase the sectional fares contract tickets on the tramways.

WEDNESDAY, JULY 2.

Wigan Council make application to the Board of Trade for sanction to borrow £5,617 for the purchase of omnibuses.—Standish Urban Council, having received no satisfaction in reply to complaints regarding tramway services from Wigan, decide to lay the matter before the Board of Trade.—At the London traffic inquiry Mr. James Devonshire, chairman and managing director of the London and Suburban Traction Company, Mr. R. H. Selbie, general manager of the Metropolitan Railway Company, and Mr. C. Watson, of the Amalgamated Association of Tramway and Vehicle Workers, were examined.—Mr. Emile Garke, chairman of the British Electric Traction Company, discussed the Ways and Communications Bill at the general meeting of the company.

THURSDAY, JULY 3.

The Select Committee of the House of Commons inquiring into London traffic conditions continue examination of Mr. C. Watson, and take the evidence of Colonel R. C. Hellard, formerly superintendent of the London Traffic Branch of the Board of Trade.—Liverpool Corporation successfully defends an action for damages sustained in an accident partly caused by the failure of the electric current on a tramcar.

FRIDAY, JULY 4.

Birmingham Corporation Tramways Bill ordered to be sent for third reading by the Select Committee of the House of Lords.—York Council accept the recommendation of the Tramways Committee that a trackless trolley service of cars be instituted to Heworth district.

MONDAY, JULY 7.

The Tramway and Electric Light employees of Southend Corporation strike for the same rate of wages as London men are paid.

TUESDAY, JULY 8.

Rotherham Corporation Tramways Committee selects Mr. T. P. Sykes, technical assistant in Bradford City Tramways Department, for appointment as tramways general manager, at a salary of £500 per annum.—Proposals submitted to Edinburgh Council for the extension of the tramways to Queensferry, via Corstorphine.—St. Annes Urban Council decides to purchase the undertaking of the Blackpool, St. Annes, and Lytham Tramways Company.—Shareholders of Blackpool and Fleetwood Tramroad Company approve of the bill providing for the purchase of the undertaking by Blackpool Corporation.—East Ham Corporation Bill and London Electric Railways Bill read a third time in the House of Commons and passed.—At London traffic inquiry, Mr. F. W. C. Ashwood, of the British Motor Cab Company, M. de Jarney, of the British Motor Cab Company, and Mr. B. Smith, organising secretary of the London and Provincial Union of Licensed Vehicle Workers, give evidence.

WEDNESDAY, JULY 9.

At Sheffield Council meeting, Sir William Clegg defends the policy of the Corporation Tramways Committee in granting £9,000 in relief of rates and keeping up fares.—Sub-committee of Edinburgh Tramways Committee consider report of Mr. Pilcher (general manager), proposing extensions to Liberton, Colinton, and Davidson's mains, and omnibus routes outside the city boundaries.—At the Select Committee on London traffic Mr. Bundy, of the Motor Owners' Association; Superintendent R. J. Halford, City of London Police; Mr. G. J. Shave, engineer to the London General Omnibus Company; Mr. C. S. Louch, accountant to the Underground Railways; and Mr. C. B. Burdon, secretary of the Garden Cities and Town Planning Association, were heard in evidence.—Standing Committee B of the House of Commons held first sitting on the Electricity Supply Bill.—Sir Auckland Geddes, President of the Board of Trade, announces in the House of Commons that the price of coal to the consumer must be raised 6s. per ton from July 16.

THURSDAY, JULY 10.

The Ways and Communications Bill passes the third reading in the House of Commons.—Tottenham Urban District Council agrees to repair the carriage-ways of Green Lanes and to accept the offer of the tramway company to relay the track with American rails.—Names of the heads of the principal departments to be set up under the Transport Bill are announced.—London Traffic Inquiry Committee take evidence from Mr. Sidney A. Parnwell, assistant general manager of the Great Eastern Railway; Mr. Dew, London County Council, representing the Cheap Trains Association, and Mr. H. H. Gordon, London County Council.—Great Northern and the Caledonian Railway Companies concede the demands of the employees.—Birkenhead Town Council inaugurate a motor omnibus service.—Liverpool Corporation arranges with the Education Committee conveyance of poor children to the city parks in tramcars at reduced fares.—Glasgow Corporation grants special passes to doctors.—On the motion of Mr. Vaughan Davies, the House of Commons refers the London County Council Tramways Bill back to the Standing Orders Committee for reconsideration.—Mr. J. Beckett, treasurer to Accrington Corporation, appointed secretary of the Municipal Tramways Association.

FRIDAY, JULY 11.

Representatives of tramway authorities in Scotland meet in Edinburgh and decide to form a purely Scottish Industrial Council.

SATURDAY, JULY 12.

Twenty passengers injured in a tramway accident in Glasgow.—London Branch of the Electrical Trades Union threatens to cease work on "Peace Day," unless certain demands are conceded.—Southend Corporation employees' strike ended on concession of all demands.

SUNDAY, JULY 13.

Aberdeen Association of Discharged Soldiers and Sailors pass a resolution disclaiming all connection with the reported threat to take women conductors forcibly off the tramcars.—Glasgow Corporation run a car a minute to Rouken Glen all day.

MONDAY, JULY 14.

National Transport Workers' Federation reported to have sent application for increased wages to the Ministry of Labour.—Meeting of National Federated Electrical Association discusses threatened strike, and refuses to pay additional rates for illumination work.——Dundee Council decides to apply for Parliamentary powers to run cars on Clepington Road.—Alderman Craddock, presenting the annual report of the Wolverhampton Corporation Tramways Committee, states that six new cars have been ordered, and that £10,000 have been granted in relief of rates.—The Special Works Committee of Plymouth Council decide to improve the Pennycomequick tramway route.

TUESDAY, JULY 15.

Rhondda Tramway Company and Pontypridd Council commence a through service of cars from Pontypridd to Porth.—Dundee Tramways Committee decides to seek powers to extend the tramways within the city.—At the London Traffic Inquiry, Lord Claud Hamilton; Mr. H. H. Gordon, London County Council; Mr. C. S. Louch, accountant; and Mr. Vernet, a director of the Underground Electric Railway Companies, are examined.—Swansea Tramways Committee agree that application should be made for powers to run omnibus services.

WEDNESDAY, JULY 16.

Conclusion of evidence at London Traffic Inquiry, Mr. H. Morrison, secretary of London Labour Party; Mr. G. W. Flood, representing London and Suburban Railway Passengers' Association; Mr. W. Murray, general manager of Walthamstow Urban Council Tramways; and Mr. H. T. Wakelam, Middlesex County engineer, being examined.—A Parliamentary Paper issued, giving a statement of the grants made and promised to highway authorities, the total amount being £8,610,000.—Leeds Corporation Bill read a third time.—Hebburn Urban Council receives the report of a deputation to Gateshead and District Tramways Company, stating that an omnibus service will shortly be provided for Hebburn.—Southport Corporation Tramways service partially resumed.—Comrades of the Great War announce that London County Council have taken steps to dispense with the services of women on the cars as speedily as possible.—Ipswich Council decides to relay and double the track on Spring Road route.—The Light Railway Commissioners favour the construction of a light railway from Southminster to Bradwell-on-Sea, but defer action for reference to the Ministry of Ways and Communications.—Portsmouth Corporation's new Thorneycroft omnibuses have a satisfactory trial run.

THURSDAY, JULY 17.

Ayr Town Council agrees to the purchase of new cars at £2,350 each, and repair and covering in of the tops of four cars at £400 each; the Council declines to ratify the Tramway Committee's refusal to meet deputations from the tramway employees and Ayr Trades Council.—Judgment against Glasgow Corporation for compensation for the loss of a wife, killed by a Corporation tramcar.

SATURDAY, JULY 19.

Peace Day variously celebrated by tramway authorities and their employees.—Eighteen persons injured by the overturning of a tramcar at Brentford.

SUNDAY, JULY 20.

A serious accident at a Bolton car terminus averted by the prompt action of a police sergeant in applying the brakes to a car which had been released by a woman passenger at the conductor's end.

MONDAY, JULY 21.

Lord Cave gives evidence in reply to the statements of Lord Claud Hamilton before the London Traffic Inquiry Committee.—A verdict of accidental death returned by a Belfast jury at an inquest held on the body of a tramway inspector, who died from injuries received in a tramcar collision.—Bradford Tramway Committee advises the Town Council to abolish collection of fares on the car platform.—Report of the Rural Transport (Scotland) Committee issued.—Halifax Tramways Committee decide to extend their tramway system by over a mile, and consider the advisability of inaugurating a new motor omnibus route.

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TUESDAY, JULY 22.

Chippenham Parish Council receives reports regarding agreements on the part of large road users to pay definite sums for the use of the roads.—Poole Corporation obtains injunction against Bournemouth Corporation, prohibiting the latter from acting on a notice given to the tramway workers on Poole section of Bournemouth tramways that they will not benefit by the terms of the National Agreement of March 20.

WEDNESDAY, JULY 23.

Doncaster Council decide to suspend the tramway service from July 26 in order to conserve coal.—Nottingham Tramways Committee resolves to stop their service at 7.0 p.m. each evening in view of the Yorkshire coal strike.—A special committee of Edinburgh Merchant Company issues a report on the development of the tramways of Edinburgh and district.—Leeds City Council resolved to reduce the tramway services in order to conserve coal supplies.—Doncaster Council seeks powers to borrow £26,000 for additional tramcars and a car shed.—Barrow-in-Furness Council agree to acquire the tramways from the British Electric Traction Company.—Lancaster Council appoints a committee to consider whether the electric tramways are to be repaired or a service of motor omnibuses substituted.—Light Railway Commissioners hold an inquiry at Coggeshall into the proposal to construct a light railway from Braintree to Marks Tey.

THURSDAY, JULY 24.

Hull City Council resolves to reduce the tramway service to five hours per day, and to suspend Sunday and all-night services, in order to save coal.—York Corporation Electricity and Tramways Committee report an agreement whereby they acquired the water-power at Stamford Bridge.—A scheme for the construction of a new route of tramways submitted to York Council.—Carlisle Tramways Company intimate intention to raise fares immediately by 50 per cent.—Edinburgh Tramways Committee receives a deputation from several women's societies with reference to the employment of women.

FRIDAY, JULY 25.

At Aberdeen the linking up of Bridge of Don and Rubislaw car services inaugurated.—Ilford municipal employees come out on strike; the electricity works shut down, and consequently tramway cars cease running.—Leicester Corporation Tramways and Electricity Committee resolve to double an important section of tramway track.—The order for the second reading of the London County Council Tramways and Improvements Bill discharged in the House of Commons, and the Bill withdrawn.—Llandudno Town Council resolve to purchase Great Orme Tramway.—Annual conference of the Tramway and Light Railway Association; papers read by Mr. W. L. Madgen and H. England; the Hon. Sir Arthur Stanley presides at annual dinner in the evening at the Connaught Rooms.

SATURDAY, JULY 26.

Ilford municipal employees' strike ended; tramway services resumed.

SUNDAY, JULY 27.

No tramway services in Hull.—Salford Corporation tramway workers demand that all women clerks must be dismissed from the cash-receiving offices and men re-employed.—Grimsby Tramway Company suspend Sunday service of cars.—Memorial service in honour of London traffic workers who had fallen in the war held at Kennington Church,

MONDAY, JULY 28.

The Municipal Employees' Association makes application to Glasgow Corporation for additions to the wages of tramway workers.—Hull Tramways Committee decides to increase the tramways services from five hours to twelve hours per day.—Halifax Council resolves to extend the tramway system from West Vale to Stainland.—Burnley tramway service stopped by an accident in the electricity works.—Doncaster Council approves of the Tramway Committee's proposal to apply for sanction of the Board of Trade to a loan of £26,000.—Report of the Select Committee of House of Commons on Transport (Metropolitan Area) published (Parliamentary Paper 147); advises immediate creation of Supreme Traffic Board for Greater London to consist of five members, and advocates greater uniformity of fares.

TUESDAY, JULY 29.

Coventry City Council proposes to seek powers to abolish workmen's fares on the Corporation tramways.—Burnley Town Clerk states that communications have been made between the secretaries of the National Transport Workers' Federation and the Municipal Tramways Association negotiating for discussion of further increases in the wages of tramway employees.—Nottingham Corporation tramway employees entertained to dinner.—Aberdeen Corporation Tramway Committee instructs the burgh surveyor to prepare plans and estimates for extension of the tramways, and approves of the construction of six additional tramcars.—Bradford Corporation Tramways attain their "majority."—In the House of Lords, Lord Salisbury moves that the Transport Bill be divided into two parts, but the motion is defeated by a majority of 51.

WEDNESDAY, JULY 30.

Tramway workers in Ashton-under-Lyne district ask an increase of 12s. on wages.—Dublin United Tramways manager fined for the overcrowding of the company's cars.—Hull Corporation Tramways Committee revises services and fares, reducing mileage run and increasing charges.—Walsall Town Council resolves to raise tramway fares.—The title of the Ways and Communications Bill changed by the House of Lords to "Transport Bill."

THURSDAY, JULY 31.

London General Omnibus Company successfully defends in an action for infringement of a patented lifeguard device.—West Hartlepool Corporation Bill passes third reading in the House of Commons.—Glasgow Town Council arranges for maintenance of tramway services on August 4, "Peace Day," granting leave of absence to those employees who desire a holiday.

LONDON SAFETY FIRST COUNCIL.

At a meeting of the London Safety First Council, held on July 22, at the Middlesex Guildhall, Westminster, a scheme for the formation of Safety First squads in schools was approved for submission to the County Council and extra-metropolitan authorities. It is proposed that every school shall have its squad, each member of which is to wear a badge, and it will be his, or her, duty to warn other children of the dangers in crossing streets, and not permit them to cross until the road is clear. The committee have arranged for the essay competition awards to be presented publicly, and to hold a special Safety First meeting for teachers.

ANTI-SKIDDING DEVICE.

The Street Safety Committee have considered a suggestion that it should be compulsory for self-propelled vehicles wherever practicable to be fitted with an anti-skidding device, and they will shortly publish a memorandum by Mr. W. Worby Beaumont, a member of the committee, on the subject of anti-skidding tires. A memorandum on street names, from the Safety First point of view, will be issued by the committee.

A suggestion that all main and secondary roads should be classified and marked, to settle responsibility for collisions at cross roads, was referred to a sub-committee for consideration.

UNIFORMITY OF STREET LIGHTING.

The Street Lighting Sub-committee recommended, and the Council agreed, that in order to secure uniformity in street lighting a survey should be made with a view to determining the classification of streets, in order of importance, in compliance with the terms of the standard specification on street lighting, presented by the joint committee representing various institutions.

PUBLICITY FOR THE MOVEMENT.

The committee reported the following gratifying statement made by Mr. Kennedy Jones, M.P., the chairman of the House of Commons Select Committee on Transport (Metropolitan Area):—"I think the work which the Safety First Council has been carrying on has been of the greatest advantage to the safety of the public."

Mr. H. E. Blain, joint hon. secretary of the Council, was congratulated upon the admirable exposition given by him before the Select Committee of the Safety First movement.

Among the awards for meritorious service approved of was a recommendation of the Chief Commissioner of Police that a Meritorious Service Badge be conferred on G. Wilkinson, a conductor in the employ of the London General Omnibus Company, together with an honorarium of three guineas, for stopping a pair of runaway horses in Romford Road.

The Drivers' Educational Committee reported that 2,523 employees of 29 firms were participating in the "Freedom from Accidents" Competition for Drivers, 1919, and that this number was a substantial advance upon the previous competition.

PATENT LIST.

Abstracted for "The Tramway and Railway World" from the Official Journal of Patents.

***** If the inventions have been communicated the names of the communicators are given in italics.**

APPLICATIONS FOR LETTERS PATENT.

The number of the patent is given in brackets.

Ticket punches (16,556)—J. P. Barker.
Indicating device for facilitating road traffic (16,597)—A. H. Bateson.
Device for locking the steering wheels of motor cars (16,598)—F. V. Becker and D. McGregor.
Front life-guard for motor vehicles (16,568)—H. B. Collins.
Hydraulic change speed gear (16,713)—W. B. Crofton.
Lubrication of motor vehicles (16,866)—S. S. Guy.
Front life-guard for motors (16,854)—J. Hennessey and E. Swift.
Axles for motor vehicles (16,582)—W. H. Hingston.
Steering and control mechanism of motor vehicles (16,693)—F. W. Lanchester.
Foot-operated controlling device for carburettors of motor vehicle engines (16,802)—R. J. Nash.
Life-saving attachment for front of road vehicles (16,375)—G. P. Ough.
Rails for street tramways (16,746)—H. J. Peddie.
Railway and tramway vehicles (16,362)—H. W. Sebbelee.
Steering wheel of motor vehicles (16,382)—H. N. Shirley.
Multiple tip wagon for motor lorries (16,351)—T. Tate.

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Life-guards (17,383)—A. D. Barry.
Electro magnetic brake for tramway vehicles (17,243)—E. Bazley.
Live axles or countershafts for motor vehicles (17,049)—J. F. Buckingham.
Brake mechanism for motor vehicles (17,050)—J. F. Buckingham.
Spring suspension of motor vehicles (17,051)—J. F. Buckingham.
Light motor vehicles (16,968)—H. M. Edmonds.
Driving means for motor vehicles (17,034)—G. Harrison (*C. S. H. Snow*).
Wheel guard and obstruction remover for road vehicles (17,138)—C. W. Mallins.
Life-guard for front wheels of motor vehicles (17,040)—L. Randerson.
Motor vehicles (17,364)—H. Stevens and A. J. Stevens and Company.
Electric ignition apparatus (17,365)—H. Stevens and A. J. Stevens and Company.
Driving mechanism for motor vehicles (17,135)—J. S. Withers (*Perfecto Gear Differential Company*).
Appliance for operating magneto-ignition apparatus of automobile internal combustion engines (17,888)—H. W. Bamber.
Starting handle for motor car engine (17,678)—H. Bevir.
Motor vehicles (17,574)—P. Bishop.
Device for use on motor vehicles (17,609)—S. C. Caddy.
Automatic anti-speeder for motor cars (17,887)—C. S. A. Chapman.
Life-saving apparatus for motor vehicles (17,873)—D. L. Cohen.
Illuminating device for use with trolley poles of electrically-propelled vehicles (17,764)—L. H. Davies.
Means for indicating movement of automobiles (17,996)—H. R. Eldred.
Radiator shield for motor vehicles (17,921)—E. A. Evers.
Means for adjusting bevel drives for motor car axles (17,715)—P. Grégoire.
Life-guards for vehicles (17,809)—L. Grose.

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Gear boxes for motor vehicles (18,044)—C. H. Hanwell and O. E. Hanwell.
Motor vehicles (17,952)—G. S. C. Huffam, W. S. Huffam, and A. E. Plumstead.
Cleansing floors of tramway cars (17,672)—N. Jamieson.
Power brake apparatus for railway vehicles (17,872)—E. S. Luard.
Reversible variable speed gear (17,897)—J. C. Massier.
Variable speed driving gear for motor vehicles (17,818)—H. W. Pearn.
Power transmission and variable speed gearing (18,002)—C. E. Pointon and J. E. Pointon.
Motor vehicles (17,900)—W. H. Sayers.
Mechanical brake (17,558)—W. B. Sheppard.
Change speed gear boxes for motor vehicles (18,031)—A. Townshend.
Resilient motor vehicle tire (17,576)—A. Trench.
Means for locking motor vehicles (17,950)—C. Wade.
Jacks for motor cars (18,400)—F. W. Apperley and J. H. Bredson.
Increasing power of overhead transmission lines (18,476)—H. A. L. Barry.
Motor vehicles (18,497)—Castle Motor Company and S. Goodwin.
Locking devices for steering gear on motor vehicles (18,168)—A. J. Cattle.
Safety locking device for steering gear for motor vehicles (18,605—J. G. Clark and S. J. Clark.
Means of locking internal combustion engines of motor vehicles (18,380)—S. Fowler, W. G. Gravell, and G. W. Humphry.
Electrically-propelled vehicles (18,548)—W. H. Glaser.
Automobile signals (18,597)—C. L. Hyde.
Automobiles (18,196)—T. B. Lewis and R. E. Parry.
Locking devices for steering gear of motor vehicles (18,168)—R. S. Macrae.
Means for locking steering wheels of motor vehicles (18,342)—E. Mepsted.
Automatic electric control of vehicles with electric transmission (18,150)—P. V. Powell and P. F. Smith.
Trollies or current collectors for electric tramways (18,336)—T. J. Smeddles.
Starting handles of motor vehicles (18,394)—J. Stanley.
Electric signalling systems (18,458)—Western Electric Company (*Western Electric Company*).

Specifications Published.

1917.

Construction of self-propelled vehicles (6,950—*127,657*)—Sir W. A. Tritton.
Starting magnetos for internal combustion engines (10,885—*128,306*)—A. H. Midgley and Vandervell and Company.
Automatic brake apparatus for motor car trailers (12,067—*128,646*)—A. E. C. Paris.

1918.

Transmission mechanism for speed-indicating and distance-registering apparatus (9,031—*127,709*)—L. E. Cowey.
Lifting jacks (9,878—*127,739*)—L. E. L. Calvert.
Safety guard for the front wheels of motor road vehicles (13,290—*127,767*)—W. H. Puttergill.
Steam engines for use on motor road vehicles (9,102—*127,941*)—T. Clarkson.
Trolley heads for electric traction (12,246—*128,051*)—B. P. Allen.
Electric motor control systems (14,861—*128,082*)—British Thomson-Houston Company (*General Electric Company*).
High-speed electric locomotives (17,316—*128,106*)—British Thomson-Houston Company and F. W. Carter).
Transmission mechanism for motor-driven vehicles—(19,695—*122,823*)—R. D. Nuttall Company.
Wheels for motor road vehicles (1,160—*128,328*)—R. W. Richards and E. Richards.
Spring suspension of vehicles (9,863—*128,369*)—B. H. Bayliss.
Lifting jacks (10,202—*128,400*)—L. Hopcraft.
Electrically-propelled vehicles (10,859—*128,420*)—P. A. H. Mossay and Mossay and Company.
Electric locomotives or cars (11,573—*128,434*)—British Thomson-Houston Company (*General Electric Company*).
Fuel supply of motor road vehicles (11,927—*128,440*)—H. C. Longsdon.
Power transmission mechanism for motor vehicles (12,072—*128,442*)—A. J. Henderson.
Apparatus for electrically controlling air brakes (12,086—*128,443*—W. J. Mellersh-Jackson (*E. P. Waterhouse and B. A. Prince*).
Car stopping and holding mechanism (15,117—*128,475*)—A. Barraclough.
Means for adjusting and attaching the actuating cables of brakes for motor vehicles (8,723—*128,701*)—Electric and Ordnance Accessories Company and G. H. Rodway.
Solid rubber tires (10,337—*128,722*)—Dunlop Rubber Company and C. Macbeth.
Mechanism for the brakes of motor lorries (11,142—*128,760*)—P. G. Hugh and G. Scammell and Nephew.
Front axles for motor cars (19,222—*128,837*)—J. R. Churchill.

1919.

Governing mechanism for turbo-generator installations (5,399—*124,203*)—British Westinghouse Electric and Manufacturing Company.
Means for converting a motor car into a motor lorry (1,170—*128,858*)—F. Osbourn.
Gauges for levelling, aligning, and curving railways (1,786—*128,860* J. Finn.

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TRAFFIC RETURNS.

Tramway and Omnibus Undertakings in the United Kingdom.

NAME OF COMPANY OR CORPORATION.	1918. WEEKS ENDED.					1919. WEEKS ENDED.					AGGREGATE.		
	July 6	July 13	July 20	July 27		July 5	July 12	July 19	July 26		Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Aberdare U.D. Council	491	495	444	456	...	521	558	539	479	...	16	8,599	+ 478
Aberdeen Corporation	2,746	2,555	2,942	2,871	...	3,382	3,282	3,515	4,096	...	7½	26,097	+ 5,479
Ayr Corporation	723	874	1,801	1,055	...	807	936	1,111	2,093	...	10	9,066	+ 1,480
Belfast City Tramways	7,619	8,592	7,339	7,662	...	10,323	10,753	9,924	9,714	...	17	173,758	+ 44,263
Birkenhead Corporation	2,349	2,150	2,285	2,285	...	2,963	2,896	3,014	3,049	...	16½	46,250	+ 11,966
Birmingham Corporation	23,559	23,721	23,334	24,260	...	24,890	25,927	24,435	24,704	...	17	435,703	+ 43,654
Birmingham Motor Buses	1,631	1,567	1,478	1,511	...	1,527	1,804	1,707	1,656	...	17	29,445	+ 3,877
Blackburn Corporation	1,858	1,734	1,945	1,844	...	2,164	2,471	2,290	2,229	...	17½	41,162	+ 9,979
Bradford Corporation	9,726	10,137	9,310	9,694	...	11,038	11,774	11,207	11,357	...	18	192,367	+ 43,563
Burnley Corporation	2,254	2,373	2,309	2,270	...	2,873	2,872	2,116	2,961	...	—	—	—
Burton-on-Trent Corporation	409	406	437	436	...	489	486	599	504	...	17	8,224	+ 1,436
Bury Corporation	2,320	2,028	2,093	2,150	...	2,369	2,370	2,243	2,476	...	16½	41,328	+ 6,641
Chatham and District	1,444	1,378	1,347	1,395	...	1,595	1,756	1,717	1,814	...	29	42,634	+ 5,695
Cork Electric	756	692	628	639	...	742	766	763	785	...	29	18,511	+ 136
Derby Corporation	1,486	1,483	1,569	1,552	...	1,962	1,981	1,684	2,010	...	17	32,138	+ 6,786
Dundee City	1,943	1,866	2,068	2,088	...	2,584	2,617	2,540	2,919	...	9½	25,238	+ 5,930
East Ham Corporation	1,561	1,533	1,523	1,577	...	1,848	1,913	1,960	1,887	...	16½	32,306	+ 7,823
Glasgow Corporation	29,442	27,599	23,784	25,961	...	32,777	32,111	30,924	25,805	...	8	254,673	+ 27,494
Glossop (Urban Elec. Supply Co.)	178	167	170	179	...	209	217	167	202	...	30	6,628	+ 1,193
Halifax Corporation	2,759	2,687	2,553	...	...	3,540	3,385	3,513	...	...	15½	55,134	+ 13,591
Halifax Motor Omnibuses	61	61	60	...	...	86	79	81	...	...	15½	1,249	+ 325
Huddersfield Corporation	3,550	3,638	3,549	3,729	...	4,730	4,780	4,984	4,712	...	17	82,973	+ 21,693
Ilford U.D. Council	1,074	1,024	952	1,034	...	1,223	1,249	1,191	825	...	16½	20,605	+ 3,950
Ipswich Corporation	803	809	785	866	...	924	955	1,109	900	...	17	15,366	+ 2,842
Isle of Thanet	334	372	365	381	...	1,460	1,676	1,719	1,710	...	42½	27,069	+ 17,746
Kilmarnock Corporation	240	243	296	308	...	279	272	308	331	...	10½	3,053	+ 448
Lanarkshire	3,958	3,619	4,885	3,722	...	4,142	4,186	4,154	4,718	...	29	101,551	— 2,360
Leeds City	14,195	14,081	14,105	14,126	...	16,606	16,396	16,318	16,424	...	17	284,387	+ 71,795
Leicester Corporation	4,652	4,632	4,542	4,678	...	5,658	5,944	4,885	6,202	...	—	—	—
Leyton U.D. Council	2,533	2,478	2,300	2,438	...	3,044	3,134	3,180	3,096	...	17	53,575	+ 16,725
Liverpool Corporation	19,886	15,801	18,401	19,027	...	23,091	23,985	24,130	24,445	...	29½	648,215	+ 128,006
London County Council	65,543	66,510	63,958	67,924	...	82,039	82,064	80,714	82,644	...	16½	1,325,198	+ 306,767
Maidstone Corporation	350	279	269	271	...	406	432	376	356	...	16½	6,363	+ 1,667
Manchester Corporation	24,236	24,520	25,619	25,937	...	30,265	30,960	30,340	30,478	...	17	518,038	+ 95,154
Newcastle-on-Tyne Corporation	8,814	8,959	9,280	9,276	...	8,739	9,175	10,392	9,918	...	17	163,498	+ 12,000
New St. Helens and District	...	...	...	...	...	...	...	...	...	...	—	—	—
Northampton Corporation	842	820	868	847	...	1,224	1,261	1,323	1,206	...	16	21,546	+ 6,904
Nottingham Corporation	6,092	5,924	5,966	6,224	...	6,862	7,319	7,057	7,307	...	17	118,669	+ 21,563
Oldham Corporation	3,341	3,336	3,558	3,649	...	4,308	4,503	4,202	4,582	...	18	79,071	+ 16,777
Reading Corporation	1,380	1,367	1,341	1,339	...	1,577	1,628	1,639	1,797	...	16½	26,468	+ 5,252
Rhondda Tramways	...	...	...	...	...	...	...	...	...	...	—	—	—
Rotherham Corporation	2,345	2,339	2,439	2,520	...	2,150	2,121	2,000	2,058	...	17½	38,828	+ 704
Sheffield Corporation	13,407	12,805	13,378	13,479	...	16,480	16,650	15,881	17,112	...	17½	299,848	+ 61,624
Southampton Corporation	2,651	2,739	2,544	2,602	...	2,784	2,795	2,722	3,313	...	16½	45,635	+ 4,014
Southend-on-Sea Corporation	1,334	1,459	1,370	1,492	...	2,454	1,775	1,504	3,057	...	17	33,749	+ 15,974
South Shields Corporation	1,148	1,164	1,269	...	...	1,318	1,366	1,201	...	...	16	21,826	+ 3,815
Sunderland Corporation	1,994	2,049	2,167	2,211	...	2,829	2,790	2,514	3,107	...	17	49,114	+ 13,502
Swindon Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
Torquay Tramways	1,045	1,043	948	1,065	...	1,194	1,404	1,347	1,422	...	29	28,718	+ 5,027
Tyneside Tramways and Tramroads	...	...	...	944	...	...	...	...	2,931	...	27	28,183	+ 2,355
Wallasey Corporation	2,151	2,014	2,000	2,133	...	2,550	2,745	2,775	2,930	...	16½	43,766	+ 12,284
Walsall Corporation	1,181	1,195	1,150	1,237	...	1,314	1,368	1,339	1,320	...	17	23,595	+ 3,119
Walthamstow U.D. Council	1,658	1,521	1,394	1,472	...	1,577	1,682	1,697	1,606	...	17	30,097	+ 5,398
Warrington Corporation	739	716	731	745	...	928	880	815	691	...	16	14,475	+ 2,346
West Ham Corporation	4,743	4,726	4,632	4,711	...	5,272	5,299	5,223	4,835	...	16½	90,852	+ 18,981
Wolverhampton Corporation	1,636	1,630	1,717	1,776	...	2,012	2,050	1,635	1,931	...	17	34,658	+ 4,859

*** A number of undertakings suspended the issue of traffic returns for the duration of the war.

Colonial and Foreign Tramway Traffic Returns.

NAME OF COMPANY.	1918. WEEKS ENDED.					1919. WEEKS ENDED					AGGREGATE.		
	July 6	July 13	July 20	July 27		July 5	July 12	July 19	July 26		Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Anglo-Argentine	52,347	55,714	54,657	56,279	...	53,018	59,213	56,827	59,632	...	29	1,598,241	— 1,714
Calcutta Rs.	78,634	78,517	72,412	77,883	...	90,803	89,493	85,786	88,787	...	29½	—	+345,697
Madras Rs.	...	...	...	...	...	...	...	...	...	...	—	—	—
Pernambuco	4,198	4,236	4,452	...	...	5,498	5,342	5,414	...	...	28½	156,594	+ 26,390

Companies issuing Monthly Statements only.

	1918.						1919.						Wks.	AGGREGATE.	
	Feb.	March	April	May	June	July	Feb.	March	April	May	June	July		1918-19.	+ or —.
	£	£	£	£	£	£	£	£	£	£	£	£		£	£
Ballarat & Bendigo	3,573	3,803	4,095	3,286	...	...	3,602	3,051	4,291	3,266	...	...	8	7,557	+ 176
Brazilian Trac. Mlrs	7315000	8094000	8330000	9030000	...	...	7972000	9330000	9208000	9562000	...	...	21	44,594,000	+3,988,000
Brisbane	32,009	35,530	35,530	...	...	...	34,380	39,380	38,775	...	...	...	17	151,110	+ 13,541
British Columbia $	501.150	510,892	515,417	486,876	488,873	...	645.415	649,120	631,988	628,947	411,605	...	52	7,062,559	+1,076,122
Buenos Ayres L'c'z.	34,397	42,647	41,643	41,315	38,375	41,145	42,429	47,370	43,607	47,317	61,356	45,222	4	45,222	+ 4,077
Burma	22,985	27,906	27,614	29,019	31,158	...	35,926	38,440	36,815	38,900	41,518	...	48	406,403	+ 106,471
Cape Town	...	...	19,011	...	17,612	...	...	...	22,564	23,405	22,432	...	—	—	—
Carthagena & H.	4,031	5,316	4,200	5,027	5,047	5,491	2,351	2,400	1,786	3,226	3,373	4,183	30	20,974	— 12,149
Cordoba	12,972	...	...	...	...	...	13,549	...	...	...	...	...	48	159,203	+ 11,492
East India	1,318	1,729	1,791	1,920	1,754	1,968	1,689	2,016	1,920	2,131	2,323	2,687	52	24,689	+ 6,760
Kalgoorlie	2,373	2,700	...	...	...	...	2,278	2,653	...	...	...	...	13	7,493	— 102
La Plata	4,746	5,348	5,169	5,105	5,135	6,721	5,698	6,592	5,630	5,702	5,105	5,317	31	39,774	+ 2,840
Lima	41,921	42,076	43,557	42,949	...	...	46,082	50,716	49,968	42,968	...	...	22	110,666	+ 8,925
Manaos Rs.	...	...	...	...	...	...	...	...	...	...	...	...	—	—	—
Manila $	168,000	172,750	163,500	175,500	...	...	211,368	207,792	212,638	183,050	...	...	21	1,046,433	+ 199,683
Monte Video	34,573	36,659	33,704	32,301	...	...	38,772	41,070	37,014	37,382	...	...	31	265,287	+ 26,949
Peruvian $	925,410	...	...	...	...	987,300	943,470	...	...	...	...	1058730	—	—	—
Para	22,198	24,848	24,745	24,925	25,445	...	23,248	26,022	25,342	24,503	24,647	...	30	172,077	+ 2,541
Port Elizabeth	...	...	4,028	...	5,404	...	...	...	5,576	5,145	4,868	...	—	—	—
Rangoon	5,662	5,955	5,885	5,719	6,163	...	5,694	7,533	6,217	6,533	6,276	...	26	38,626	+ 927
Toronto $	981,933	1113472	1065766	1090747	1035932	...	1015797	1083285	1051960	1032717	842,697	...	26	6,133,296	— 222,873
Winnipeg $	298,899	307,289	...	280,935	293,140	...	371,162	384,937	...	248.191	112,615	...	26	1,874,640	+ 63,302

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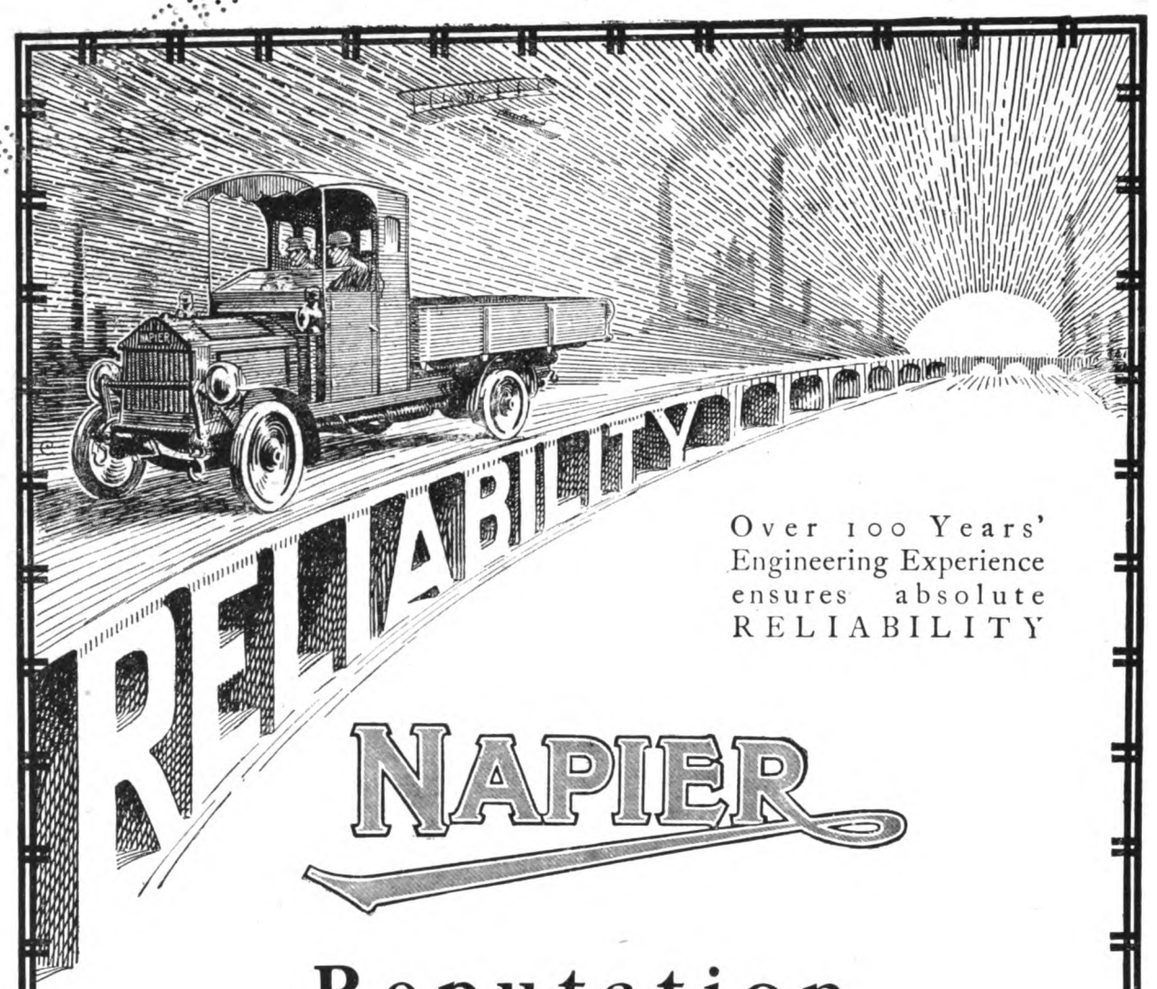

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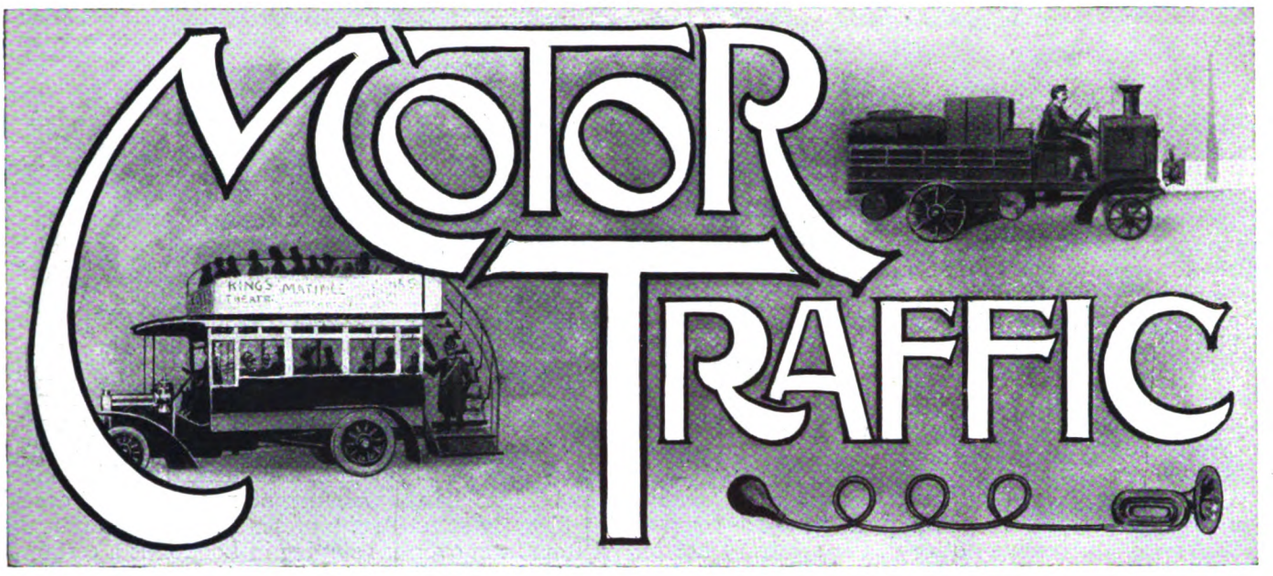

PETROL TAX AND LICENCE DUTIES.

When the Chancellor of the Exchequer introduced his Budget Statement he made it quite clear that he was not by any means satisfied that the Petrol Tax afforded the best means of obtaining revenue from the owners of motor vehicles. The most obvious objection to the tax is the difficulty and cost of its collection. Petrol is not taxed as such but only if it is used as a motor fuel. Consequently complex machinery has to be devised for collection, and the complication is further increased by the fact that certain classes of motor users are entitled to a partial rebate. Another obvious demerit of the system is that it does not fall equitably on all users of motor vehicles, but lays the whole burden on those who use vehicles which obtain their power from one particular class of fuel. Under the present system the steam vehicle and also the electric vehicle are exempt. Assuming that we must reconcile ourselves to some form of taxation applied not only to private cars but also to commercial vehicles, it is important to ascertain what must be the features of an ideal system.

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First of all it must bear equitably upon all users and must not pick out special classes of users for preferential treatment or for heavy taxation. The purpose of the tax is presumably to raise revenue for road improvements or road maintenance. Therefore the amount of the tax paid in respect of any vehicle should be proportionate to the injury which that vehicle does to the roads. A rubber-tired vehicle is less injurious to the roads than one which has metal tires, and consequently the taxation of the former class should be lower for any given mileage. Leaving tires on one side, we may take it that, roughly speaking, the wear and tear of the roads is proportionate to the mileage covered by the vehicle, to its weight and to its speed. This brings out the strong point of the Petrol Tax. The consumption of petrol goes up with every increase in speed, in weight, and in mileage. It may, therefore, be taken as bearing some direct relation to the wear and tear of the roads caused by the vehicle. To this extent it is theoretically correct and the same certainly cannot be said of any system of licence duties.

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The great beauty of the licence duty is that it is simple to collect. Its disadvantage is that it bears no relation to the extent of use made of the vehicle. By getting out a proper scale we could make licence duties bear some relation to weight and speed by linking up the system of taxation closely with the regulations as regards the use and construction of motor vehicles, on the basis of some simple arbitrary formula. Thus we might conceivably multiply the maximum legal weight of the vehicle in tons by its maximum legal speed in miles per hour, and utilise the numerical product. For instance, a vehicle weighing 6 tons laden and travelling at 12 miles an hour would give us a figure of 72. A vehicle weighing 12 tons laden and travelling at a speed of 6 miles an hour would give the same figure and the licence duty in the two cases would be the same. We could deal with the question of tires by dividing the figures by 2 if rubber tires were fitted. This would not mean necessarily that the rubber-tired vehicle would pay less than the iron-tired one, because its legal speed would certainly be higher. It would merely recognise the fact that rubber tires are less injurious to the roads. If licence duties are to take the place of the petrol tax, some such scheme as that indicated would probably be the best. Unladen weight might be made the basis of calculation and this conceivably would be an improvement, because it would encourage the construction of vehicles as light as possible consistent with adequate strength to carry their loads. We must, however, remember that the purpose of taxation is to meet part of the cost of road improvement, and wear of the road is more nearly proportionate to the laden weight than to the unladen weight. A possible compromise would be to take a figure half way between the two.

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If licence duties are to take the place of the petrol tax, it seems clear that those levied in respect of commercial vehicles must not be worked out on a similar basis to that employed for private cars. The adoption of any scale based on estimated horse-power would be very injurious to the best interests of the movement. For such a purpose the best we can do is to estimate horse-power with the assistance of some simple arbitrary formula. It is impossible to devise any formula which will not encourage some sort of abnormality in design. Thus, the formula at present used favours an engine with an excessively long stroke. There is no serious harm in basing licence duties on estimated horse-power so long as the total amount of such duty is small, but in the case under consideration the duties would be fairly large, because they would be expected to produce the same revenue as is now obtained from

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the petrol tax. Suppose that a vehicle averages 10 miles to the gallon and travels 500 miles a week for 50 weeks in the year, we have an annual consumption of 2,500 gallons. If the net revenue from the petrol tax amounts to no more than about a penny a gallon the proceeds from the vehicle will still be upwards of £10 per annum, the amount actually paid by the vehicle owner being considerably higher. From this rough calculation it is clear that licence duties intended to displace the petrol tax would not amount to merely a few shillings, but would be a matter of several pounds, and this would be sufficient to constitute a selling point in favour of any vehicle in respect of which the licence duty payable was comparatively small. There would, therefore, be a tendency to compel designers to take undue notice of the arbitrary horse-power formula employed.

PAPER FOR THE ROAD CONGRESS.

Some of the papers to be read at the Road Congress organised by the County Councils' Association for November next will be of interest only to those concerned with the construction of roads. Others, however, will make a far wider appeal. A subject which should interest practically all Municipal and Government officials is the provision for and development of future traffic with special reference to the construction of new roads, the financing of the road system and the provision of new transport services. This discussion should, in fact, be in the nature of a debate on the work which lies in front of the new Ministry of Transport and ought to be productive of useful suggestions for proper collaboration between the Ministry, local authorities, and road users. A paper dealing mainly with the liability of the heavier types of vehicle to extraordinary traffic damages will probably give an opportunity to the extremists who would like to put the roads under a glass case and forbid their use. They will not, however, have matters all their own way, because on this occasion the congress will be attended by delegates from all the motor trade and using organisations. Particular interest attaches to the arrangement for two papers to be read on the weight, construction, and speed of mechanically-propelled vehicles in relation to the construction and maintenance of roads. This subject is to be introduced from one point of view by a road engineer and from another point of view by a motor manufacturer. The variations between the two standpoints and the animated discussion which is bound to follow should be both interesting and instructive.

COMMERCIAL MOTOR EXHIBITIONS.

It has been suggested that exhibitions of commercial motor vehicles at Olympia should be abandoned in favour of the creation of a strong Motor Transport Section at the Annual Show of the Royal Agricultural Society. This is unquestionably a business show, and the idea offers the advantage that it would help to familiarise people in different districts with the extraordinarily wide scope of the motor vehicle. On the other hand, manufacturers may be inclined to argue that London is the best place for an exhibition at which many agency agreements are generally negotiated. Frequently the accommodation available close at hand during the Royal Show is very inadequate. Invariably it is very expensive. Most business men have occasion at one time or another to go to London. It is often possible to time a visit so as to fit in with the date of the show. This argument does not apply to the majority of provincial towns. Another point is that the Royal Show is, and must continue to be, primarily organised for the farming community. It is a good place at which to show a vehicle particularly intended for rural transport, but it seems hardly consistent with the dignity of a great industry to be content to appear as a kind of side line, constituting only a small secondary part of a big organisation. In all probability the next Olympia Commercial Vehicle Show will be held in the summer of 1920. If the date is intelligently selected, the presence of large numbers of visitors from overseas staying in London is a certainty, and in the near future it will be, if anything, upon the overseas markets, even more than upon the home markets, that the motor industry will have to depend for its prosperity.

RAILLESS CARS FOR YORK.

York Corporation have adopted a recommendation of the Tramways Committee for installing the railless trolley system of traction in the Heworth district. The estimated cost of the cars is £8,000, and the overhead construction £3,688. The committee reported that the difference between the cost of running petrol omnibuses as compared with the trackless vehicles, taking the present price of benzole at 2s. 3d. per gallon, for 80,000 miles would result in a saving of £800 per annum if trackless vehicles were used. This sum would be more than sufficient to pay interest, sinking fund, and maintenance charges on the overhead lines, and at the same time the trackless trolley vehicles would provide a good consumer for the Council's electricity department.

The tramways manager has been authorised to place an order with the Railless, Limited, Company for four railless cars, at £2,000 each, subject to certain contractor's stipulations.

TOP-COVERED OMNIBUSES.

ACCOMMODATION FOR SIXTY PERSONS.

The St. Louis Motor Omnibus Company has applied to the Board of Public Service for permission to operate a service similar to those in Chicago and Newark. It is proposed to run 60 vehicles, each having an enclosed upper deck and accommodating 60 persons. Five per cent. of the gross receipts is offered to the city for a franchise. The fare is ten cents, with no transfer privileges.

One hundred double-deck omnibuses, each seating 47 passengers, are being put into service in Detroit, the vehicles being similar to those in use in New York. The capital of the company is $1,500,000, and the president is Mr. R. W. Meade, formerly president and general manager of the Fifth Avenue Coach Company, New York City. The fare will be ten cents, and the company proposes to operate under a city ordinance licensing the vehicles on certain streets.

ADVISORY COMMITTEE ON BENZOLE.

The National Benzole Association announces that with the co-operation of the Motor Fuels Committee an advisory committee has been formed—(1) To advise on any general matters, the National Benzole Company, Limited, may be referred to for assistance and suggestions. (2) To make suggestions to the company in respect of any proposals to popularise the use of benzole for motor transport and increase the consumption. (3) To watch the developments of every home-produced motor spirit, and to advise the board as to co-operation in any or all of these developments.

The committee comprises E. S. Shrapnell-Smith, chairman (nominated by the directors of the National Benzole Company, Limited), D. Citroen (by the Society of Motor Manufacturers and Traders), B. Coachute (by the Agents' Section, Limited), Stenson Cooke (by the Automobile Association), A. W. Torkington (by the Royal Automobile Club and Auto Cycle Union), Walter Wolsey (by the Commercial Motor Users' Association), and Horace Wyatt (by the British Motor and Allied Manufacturers' Association).

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PNEUMATIC TIRES FOR HEAVY VEHICLES.

Need for Special Design of Chassis.

At the commercial vehicle section of the summer meeting of the Society of Automotive Engineers, held at Ottawa Beach, Michigan, on June 24, the question of pneumatic tires for trucks occupied some attention in a discussion on "The Relation of Motor Truck Ability to the Trend of Design." The paper on the subject was introduced by Mr. L. P. Kalp, assistant supervisor of engineering for the Standard Parts Company, Cleveland.

The opener's view, derived from tests, was that performance on high or third or fourth gear is no true test of a truck's ability, and the same contention was upheld by Mr. H. L. Horning, chief engineer of the Waukesha Engine Company, who told of a test made by his company which conclusively proved that the real measure of truck ability was its performance in first and second speed work.

Mr. Kalp also referred to the question of the use of pneumatic tires instead of solids, and pointed out that the great variance in the conditions of speed and load set up by the two classes of tires required that the employment of such tires made it necessary that the trucks be designed separately and distinctly for the two classes of service. When the speed of a truck is increased from 12 to 25 miles an hour, the problem of wind resistance with the large truck bodies assumed considerable importance and required that the power of the engine on the pneumatic-tired truck be increased approximately 1/100.

In general it can be said that high gear ability should be sufficient to overcome average road resistance with a sufficient surplus to climb the grades that are encountered with such frequency that gear shifting would be objectionable. The low-gear ability should be sufficient to overcome practically the worst conditions of grade and road. It made no difference to a truck's ability whether the drive be through the front wheels, rear wheels, or all four wheels, or whether the load be carried on the truck or on a trailer.

Factors Arising from Pneumatic Tires.

Proceeding, Mr. Kalp said :—There is another trend in connection with which the matter of ability should be given careful consideration. That is pneumatic tires for large trucks. The strongest reason for the use of pneumatic tires on heavy trucks is to increase the speed and consequently the ton-miles per day without injury to the vehicle. From a standpoint of dollars and cents, I do not see how pneumatic tires can be sold to replace solid ones unless this is accomplished. The cost of pneumatic tires is higher than that of the solid type, and unless the owner is able to get an increased return on his investment, due to an increase in ton-miles, he cannot be induced to invest the extra money in pneumatic tire equipment. Increasing the truck speed means an increase in engine speed or a reduction in gear ratio. It certainly is not desirable to increase engine speed, for as surely as this is done an increased amount of trouble will result.

Now any reduction in gear ratio will result in lowered ability. No one knows whether road resistance is more or less with pneumatic than with solid tires. This much we do know, however. When the speed of a truck is appreciably increased, the ability should approach closer to that of passenger cars. Road and grade resistance are no longer the only forms of resistance to be overcome. Not only does wind resistance become a considerable factor at higher speeds, but the car must have an ability reserve to accelerate to this increased speed within a reasonable length of time.

More Powerful Engines Needed.

Thus, the use of pneumatic tires calls for not only increased speed but increased ability. Power being the product of force by velocity, it is evident that the engine must develop horse-power. It being inadvisable to increase the engine velocity, it is evident that the engine must develop greater horse-power. It being inadvisable to increase the engine speed, there is only one thing left to do, and that is to increase the size of the engine. This means a corresponding increase in the transmission drive shafts and in fact in all the power-transmitting parts of the chassis. There is no doubt that the use of pneumatic tires will permit an appreciable reduction in the weight of all load-carrying parts of the chassis. I am inclined to believe, however, that this saving will be offset by the increase in the engine and other power-carrying members, so that there will be no ultimate saving in weight or cost.

Let us compare a 3½-ton truck intended to operate on solid tires with one designed especially for the pneumatic type. The specifications of the solid tire truck may be assumed somewhat as follows :—

Total weight of vehicle	lb.	15,300
Rear tire size	inches	36 × 5 dual
Speed, miles per hour		14
Engine size	inches	4½ × 5¾
Piston displacement	cubic inches	365·8
Axle ratio		8¾ to 1
Engine speed ...	revolutions per minute	1,141
Ability coefficient	lb. per lb.	0·07

For the pneumatic tire truck let us assume a speed of 20 miles per hour. At this speed we should have an ability of about 0·08 lb. per lb. in order not to exceed 1,200 revolutions per minute engine speed. With 44 × 10 in. rear tires, the axle ratio should be approximately 7¾ to 1 and the piston displacement would then be 578 cubic inches. This is approximately the displacement of a 5½ × 6 in. or a 5¼ × 6½ in. engine, and is even larger than is used for a 5-ton truck on solid tires.

I do not wish to be understood as opposing pneumatic tires for trucks. In fact, I believe that the increased use of pneumatic tires will greatly widen the field of usefulness of motor trucks and should be encouraged by all truck builders. The point that I wish to bring out is that high-speed pneumatic tire trucks and slow-speed solid tire trucks are fundamentally two different propositions, and should be treated as such. To operate successfully on pneumatic tires a truck should be especially designed, and should partake more of the characteristics of a large passenger chassis than do the trucks now operating on solid tires.

In a further discussion of the use of giant pneumatic tires on large trucks, Mr. Hale, of the Goodyear Company, stated that some of his company's trucks running between Akron and Cleveland were fitted with 10-in. tires in the rear, which gave from 10,000 to 12,000 miles, and with 8-in. tires in the front, which gave between 15,000 and 20,000 miles. He also said that his company found it desirable to fit 3½-ton engines in 2-ton trucks with pneumatic tires and 5-ton engines on 3½-ton vehicles.

EIGHT QUESTIONS FOR DRIVERS.

To overcome the difficulty of getting drivers to read books of instruction issued by truck makers, the Packard Motor Company, of Detroit and New York, have opened schools. The teaching is divided into class room lessons and actual road tests. At the conclusion of the training the following eight questions must be answered correctly :—

(1) What is the purpose of a radiator and water ?
How does the water do its work ?
Why is it necessary to keep the radiator full ?

(2) What different kinds of oil are necessary to good lubrication of a truck ?
Why does the cylinder require a different kind than the differential ?

(3) What change takes place in the cylinder when you advance the spark lever ?
Should you advance or retard the spark when the engine is working up to its limit and why ?

(4) How many times does the piston go up and down in the cylinder every time an explosion takes place ?
What is the action of the gasoline gas in the cylinder from the time one explosion takes place until the next one occurs ?
Why are the carburetter and intake manifold water-jacketted and what advantage is gained by such construction ?

(5) What happens to the cylinder when the motor is run without oil ? Water ?
What happens to the bearings when the motor is run without oil ? Water ?

(6) What happens when you are coasting down hill and suddenly let in the clutch ?

(7) Why is it not good to put on the brakes suddenly ?
If you do, what happens to the brake shoes ?

(8) What does running in car tracks do to the tires ?

The questions are elementary, but unless a driver has the knowledge required to answer them satisfactorily he is unable to give the various parts the care required to secure a low operating cost. Three instances may be cited. Take the necessity of proper lubrication and proper engine cooling. Without sufficient water the engine overheats, thereby tending to neutralise the effect of the lubricating oil and results in bearing wear and high gasoline and oil consumption per mile run. The proper answers to the questions regarding the advancement or retarding of the spark lever when the engine is working up to its limit ensures that the driver will get the most out of his engine and probably reduce the fuel consumption.

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MANCHESTER CORPORATION OMNIBUSES.

In the annual report on the working of the Manchester Corporation Tramways for the year ended March 31, 1919, the following results are given of the running of the department's motor omnibuses :—

Number of omnibus miles run, 218,292. Passengers carried, 1,821,310.

Traffic revenue, £13,569.

	£	1919. Per 'bus mile. d.	1918. Per 'bus mile. d.
TRAFFIC EXPENSES—			
Superintendence and other traffic wages	182	·200	·200
Wages of drivers and guards	2,280	2·507	2·631
Bonuses and sick pay	36	·040	·039
Cleaning and oiling	654	·719	·599
Depot expenses	176	·192	·163
Ticket check	259	·285	·246
Uniforms	103	·113	·134
Licence and sundries	58	·065	·052
	3,748	4·121	4·064
GENERAL EXPENSES—			
Salaries and wages, administration	125	·138	·140
Rates on depots	80	·088	·089
Printing and stationery	21	·023	·020
Fuel, light, and water	20	·022	·018
Compensation	50	·055	·055
Insurances	40	·044	·044
	336	·370	·366
REPAIRS AND MAINTENANCE—			
Tires	483	·530	·406
Chassis	1,364	1·500	1·032
Bodies	232	·255	·284
Buildings and machinery	54	·060	·060
	2,133	2·345	1·782
POWER EXPENSES—			
Petrol	4,367	4·801	3·352
Total working expenses	10,584	11·637	9·564
War bonuses	1,523	1·674	·745
Depreciation	1,252	1·376	1·385
Balance carried to tramways account	210	·231	1·730
	£13,569	14·918	13·424

OMNIBUSES FOR EDINBURGH.

Edinburgh Tramways Committee have recommended the City Council to apply for authority to run motor omnibuses on any route within five miles of the city boundary, or alternately on the following routes :—

1. Craiglockhart tramway terminus, via Colinton, Juniper Green, and Currie, to Balerno.
2. Slateford Road tramway terminus, via Juniper Green and Currie, to Balerno.
3. Murrayfield tramway terminus to Corstorphine.
4. Blackhall (city boundary) to Davidson's Mains.
5. In connection with Dalkeith Road and Duddingston route, a small portion of roadway at Duddingston outside city boundary.
6. On any route where power has been obtained to operate electric tramways.

TRACTION EXPERIMENTS PENDING.

Holland Division County Council (Lincolnshire) has received a letter from the Board of Agriculture, stating that the light railway scheme of the Council had been considered. Owing to the heavy expense involved and the fact that many similar proposals had been received from other Councils, the Board does not feel justified in supporting any proposal for light railway construction, wholly or largely at the cost of the State, until certain experimental transport services contemplated by the Department have been in operation long enough to furnish data for the consideration of further cases.

ROAD TRANSPORT DURING A STRIKE.—During the strike of North Eastern Railway employees in the third week of July, the road motor transport organisation of the Newcastle district proved of great service in bringing supplies of meat and milk to the city from the Berwick area.

PORTSMOUTH OMNIBUSES.

In accordance with the long-established policy of the Portsmouth Corporation Tramways Committee and their manager, of experimenting with innovations likely to improve the services, it was decided a few months ago to supplement the tramways by a fleet of ten motor omnibuses. It was something of a problem to secure early delivery at a time when the manufacturers were turning their works over from war to peace products, even although the firms might have been engaged in building lorries for the military services. However, satisfactory arrangements were made with John I. Thorneycroft and Company, Limited, whose war products not only assisted in overcoming the enemy in the field but also helped to defeat the submarine menace. It is fitting, therefore, that the streets of our greatest naval dockyard should contain a constant reminder of the enterprise of one of the foremost of British manufacturing companies.

Up to the third week in July six of the ten vehicles had been delivered. The bodies, which are attractively decorated in the tramway colours, give inside seats for 16 passengers, 18 on the top deck, and two by the side of the driver. The chassis are of the well-known model " J " type, of 40 H.P., improved with such alterations as have been suggested by war service. Dunlop heavy service solid tires make the running comparatively smooth, and the up-to-date nature of the accessories is shown by the arrangements for electric illumination, which provide for two head lights, six inside lights, two side lights, and one at the rear. The indicator board is also illuminated. Before the vehicles were put in service, the members of the Tramways Committee were taken by Mr. W. R. Spaven, the general manager, for a run round the borough, when they expressed their gratification at the management having recommended so satisfactory a type of vehicle. Until the Peace celebration had been concluded, the service was confined to the North End and Clarence Pier route at a similar fare as is charged on the tramcars, i.e., twopence. The new vehicle met with instant success. Two illustrations of the vehicle appear on the following page.

L.G.O. LIFEGUARD SUIT.

In the Chancery Division on July 31, Messrs. G. R. Bonnard, P. Hawksworth, and C. B. Burdon applied for an injunction to restrain the London General Omnibus Company, Limited, from infringing a patent relating to a life-guard.

Mr. Justice Sargent said that he was sorry he had to decide against the plaintiffs. Hawksworth's patent, which was the subject of the action, was granted in 1912 for a safety device or life-guard for motor vehicles. The company's pleas of non-infringement and non-utility became unsustainable, inasmuch as a device indistinguishable from that described in the patent had been adopted on almost all the company's omnibuses. He had, therefore, only to consider the defence of want of novelty and want of subject matter. Guards of the same general construction had been in use for many years between the front and back wheels of tramcars, and the only difference between them and the guards of Hawksworth, apart from a difference in height, was that the tramcar guards were parallel with the sides of the cars instead of having an inclination.

MOTOR USERS AND THE ROADS.

At a complimentary luncheon given to Mr. Joynson Hicks, M.P., by the National Council of the Commercial Motor Users' Association, in recognition of his services in securing amendments to the Ways and Communications Bill, Mr. Hicks said it had been asserted in Parliament that motor users did not pay enough for the maintenance of roads, but he pointed out that in extra taxation they paid £4,000,000 out of the £20,000,000 which is the total cost of maintaining the roads. Now, however, £37,000,000 is required to bring the roads up to the pre-war standard of condition, whilst a further £40000,000 is required to provide new roads and bridges.

HEBBURN PROMISED OMNIBUS SERVICE.—In response to a deputation from Hebburn Urban Council, the Gateshead and District Tramways Company have promised to institute a motor omnibus service for the locality at an early date.

TRACKS FOR MOTORS.—Reporting on the proposed improvements to be made on the roads and transport facilities in Aberdeenshire, the Rural Transport Committee recommend that concrete tracks should be made to Echt and Skene and to Newburgh, drivers of heavy motor vehicles being obliged, under penalties, to use those tracks.

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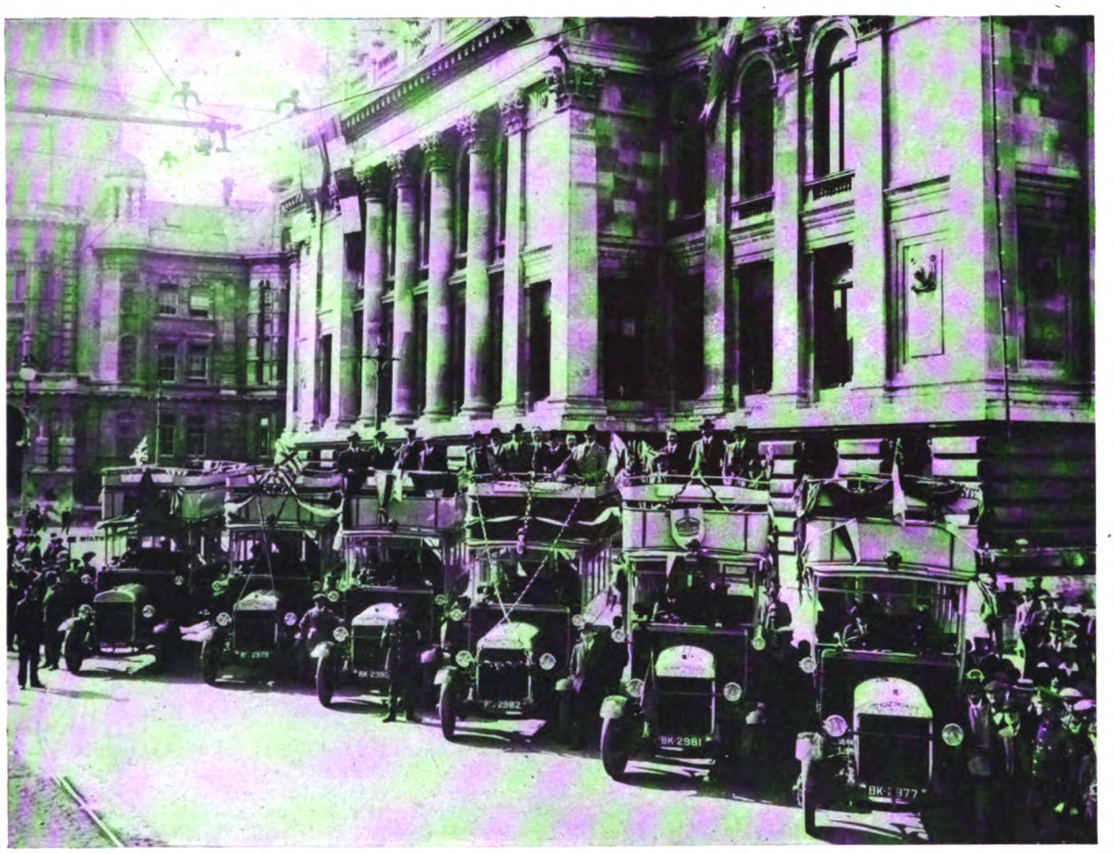

Thornycroft Omnibuses Paraded at Portsmouth Town Hall.

The Public interest in the Portsmouth Corporation Omnibuses.

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FIVE WAYS TO REMOVE WHEELS.

PLANS OF SIMPLE DEVICES TO FACILITATE THE WORK.

If the right methods for removing the wheels of commercial and industrial motor vehicles is not known the task is a troublesome one. As wheels of large lorries weigh as much as three-quarters of a ton, it is impossible to lift them bodily. The following directions from the *Commercial Vehicle* (New York) will prove of interest :—

Probably the simplest means of removing a heavy rear wheel is by the use of a greased plank (Fig. 1). The wheel is jacked up so that

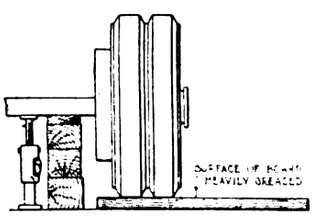

Fig. 1.—The wheel is first jacked up by raising the rear axle V, placing blocking as shown to ho'd the truck up should the jack slip. The jack is then lowered until the wheel rests on the greased plank.

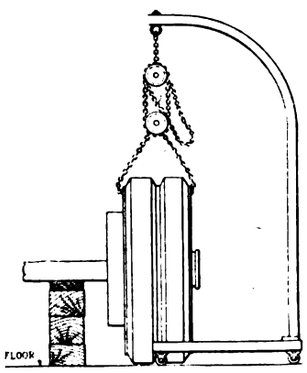

Fig. 2.—One of the most conventional methods to remove truck wheels is by the use of a portable overhanging crane with a semi-circular-shaped base to straddle the wheels so that a direct upward pull may be secured.

a smooth plank with a heavy coating of grease may be slipped underneath it. Blocking also is put in place under the axle so that when the wheel is removed there is a substantial support reinforcing the jack in case anything happens to it, and also it stands ready to assume the weight as soon as the jack is removed.

The retaining nuts holding the wheel are removed and then the jack is adjusted by slowly moving the handle until only the weight of the wheel rests on the board, the remainder of the weight being carried by the jack. At this moment the wheel is pulled off.

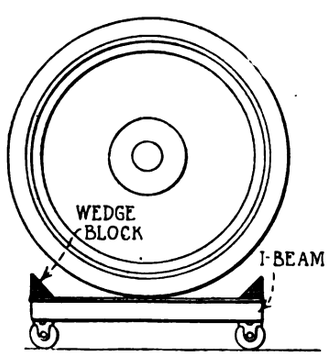

Fig. 3.—A steel platform on castors. When just the weight of the wheel is supported on the platform, the wheel may be pulled off easily.

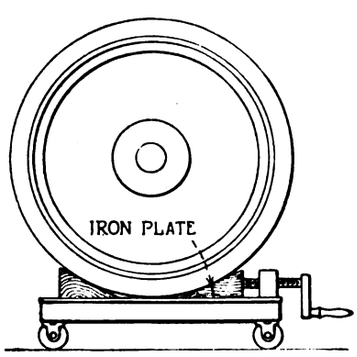

Fig. 4.—A more elaborate type of platform with a stationary wedge piece and a movable wedge operated by a screw and a crank handle.

The use of a portable overhanging crane is shown in Fig. 2. The wheel is blocked up so that it is well clear of the floor and then the chain is attached and the hoist operated until it is just carrying the wheel. Then, having removed any retaining nuts, the wheel may be withdrawn.

Fig. 3 shows a sturdily-constructed steel platform mounted on castors. It is used in the same manner as the greased board. It is placed under the wheel and the jack manipulated so that only the weight of the wheel rests on the platform. Then the wheel is taken off. The wedge blocks are simply to prevent the wheel from rolling sidewise.

A more elaborate type is shown in Fig. 4. As in the previous case it consists of a heavy steel platform mounted on castors. One of the wedge blocks is stationary and the other is moved in and out by a crank-operated screw. In operation the axle first is jacked up so the platform may just be slipped underneath, then the wedge is screwed in until it just lifts the weight of the wheel off the axle, when the wheel may be pulled off.

Fig. 5 represents the type, totally different. The wheel hangs on a bar which is suspended from an I-beam cross-piece. The up-and-down adjustment of the wheel is maintained on one side by a sliding sleeve and pin arrangement and on the other by a large jack, its size being to obtain the requisite height, its great lifting capacity being only incidental. With modifications almost any jack would do. The base consists of a U-shaped member bent into the form of a semi-circle and supported by three castors.

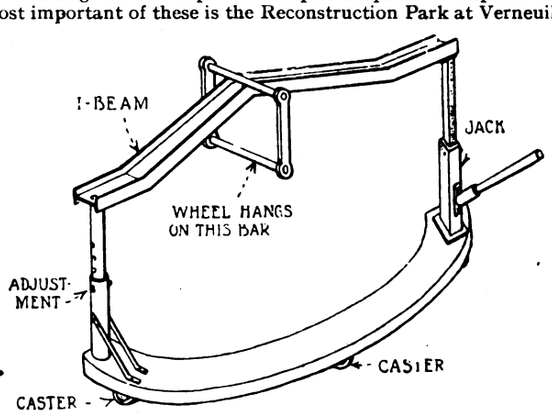

Fig. 5.—A special device built in the form of a truss with an adjustable leg at one end and a jack at the other to provide the lifting effort. The wheel is chained to the hanging bar.

DISPOSAL OF U.S.A. TRUCKS.

A considerable quantity of United States war motor trucks and trailers, comprising nineteen special types, such as machine shop, printing press, laboratory and photograph trucks, and seven types of special trailers, have been ordered to be returned to the United States from France.

Judged by the shortness of the period that they had been in France the U.S.A. army appears to have accumulated motor vehicles there more rapidly than was the case even with the British army.

At the end of December, 1918, the army possessed 32,500 trucks. Only a small number of these is required for the Army of Occupation, and the rest must be disposed of in Europe or returned to America. The Liquidation Board have prepared a detailed statement of automotive material no longer required by the army, and have submitted it to the French Government, who alone have authority to say whether the material shall remain in France or not.

Some of the vehicles have been sold to the Allies other than France, who are in urgent need of them. A number of trucks have gone to Roumania, Serbia, and Belgium. In addition, the Reconstruction Department of the French Government has taken some for its own use. When these purchases have been made the officers of the Liquidation Board have insisted on sufficient spare parts being taken to keep the vehicles in efficient service for at least six months. This has been done in order to protect the interests of the American manufacturer.

There are large service depots and repair shops to be disposed of. The most important of these is the Reconstruction Park at Verneuil, which has big machine shops and immense stocks of spares, including 146,000 solid tires. Owing to the shortage of buildings, these tires had to spend the winter out of doors without protection, and have suffered a little in consequence. They are inch sizes, and could not be used on European vehicles.

As to the disposal of the Verneuil shops, it has been rumoured that the White Company had an option on the entire place. Inquiries show that while the White people are interested, no option has been given to them.

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MOTOR TRAFFIC

ALCOHOL FOR FUEL.

Mr. E. S. Shrapnell Smith, late of the Petroleum Executive, has informed the members of the Automobile Association that by a new process, synthetic alcohol can be produced from ethylene extracted from gas obtained from the distillation of coal, whether in gas works or in coke ovens. If all the available gas were treated there would be something like 150,000,000 gallons of power alcohol annually available as motor spirit, and part of this mixed with benzole would furnish about half of this country's requirements in motor spirit. It would be desirable to use for a mixture about half benzole and half alcohol, and since the quantity of benzole at present in sight does not exceed 50,000,000 gallons a year, there would be no need from a motorist's point of view—nor, indeed, would it be possible—to strip all the gas of its ethylene. It should be possible to obtain annually 50,000,000 gallons of synthetic alcohol, from which, together with benzole, we could ensure from home sources 100,000,000 gallons of a motor spirit that could be used in internal combustion engines of standard design.

MOTOR SPIRIT DUTY.

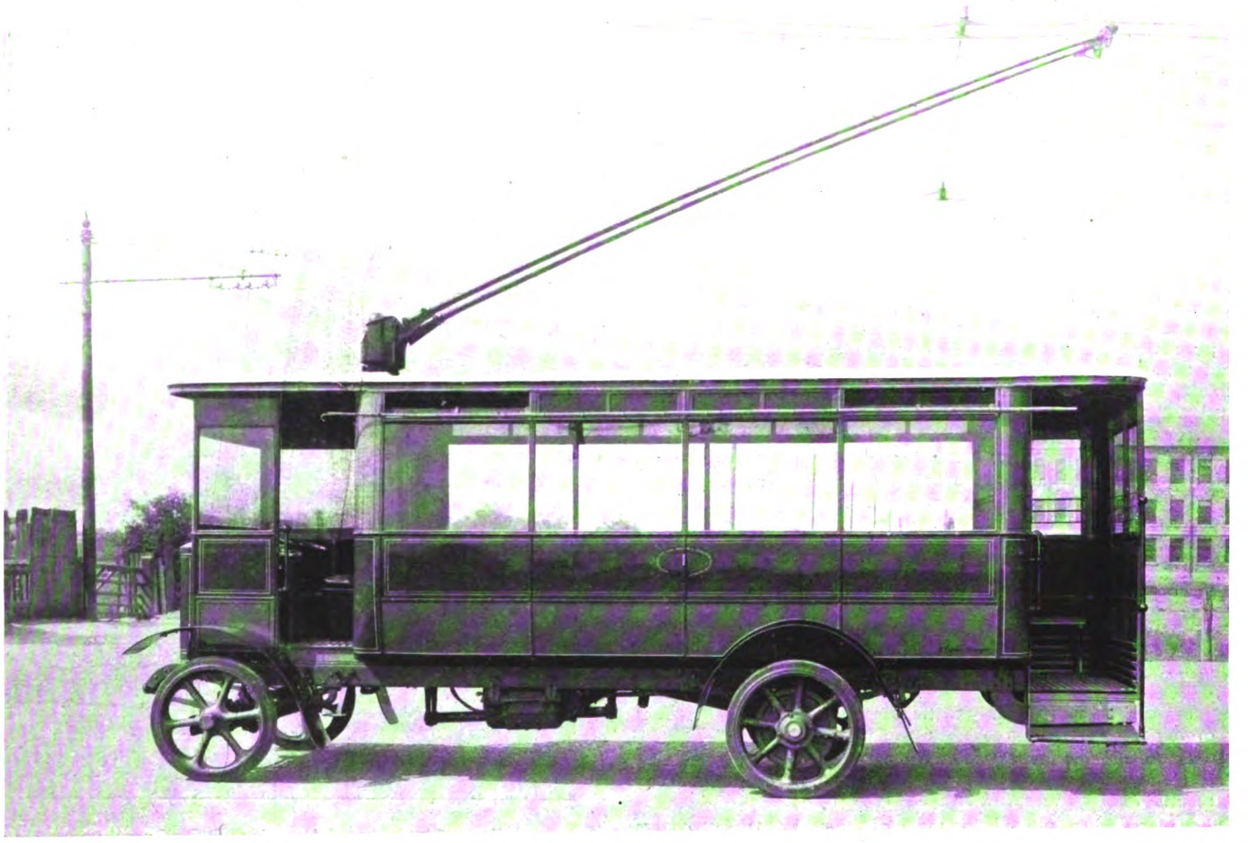
During the consideration of the Finance Bill on July 23, Mr. Joynson-Hicks moved an amendment repealing the Customs duty on motor spirit. He explained that his object was to obtain an assurance from the right hon. gentleman that as soon as the war period had passed he would divert this tax to its original purpose, which was the upkeep and development of the roads.

The Chancellor of the Exchequer (Mr. A. Chamberlain) said he had no hesitation in giving the assurance that this duty or its equivalent should be diverted to its original purpose, the upkeep and development of the roads of the country, at the earliest possible moment. He had no intention of going back on the original bargain made between the Prime Minister and the motorists when this tax was first diverted from its original purpose. He indicated in his Budget speech that this tax was a costly one to collect, and a very inconvenient one, and he would like to find another method by which motorists should contribute to the revenue, in lieu of the present tax. He repeated the invitation to the motoring interest to bring forward some proposal as to something more suitable from the point of view of revenue, and more convenient from its own point of view.

Mr. Joynson-Hicks, in view of the assurance of the Chancellor of the Exchequer, withdrew his clause, although he would have much preferred that the right hon. gentleman should himself submit a new tax.

RAILLESS CARS FOR MIDDLESBRO'.

During the war progress with railless traction, as with all other methods of public transport, was in suspense. With the return of peace there are arrears to make up and many new projects to be developed, in which railless traction, being the cheapest method of transport, is bound to play a leading part.



One of Ten Cars Supplied to North Ormesby Traction Company by Railless, Limited.

The vehicle here illustrated is one of ten which are now being delivered to the North Ormesby Traction Company at Middlesbro' by Railless, Limited, of 56, Moorgate Street, London, E.C.2. The leading characteristics are as follows :—Length, 22 ft.; width, 7 ft.; seating capacity, 28. The cars are capable of maintaining a speed up to 16 miles per hour even when overloaded, and consume on the average not more than one B.O.T. unit per car-mile.

ROAD WORK SUPERVISION.

In order to enable the surveyor's staff to supervise the great amount of road work now being undertaken, Surrey County Council have arranged to purchase a four-seat standard Ford car for £271.

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MOTOR TRAFFIC

INJUSTICE TO THE TROLLEY OMNIBUS.

RESULTS AT DUNDEE PRONOUNCED BY THE GENERAL MANAGER TO BE SATISFACTORY.

Members of the Select Committee on London Traffic would not desire to make remarks that may be construed as unfair to a particular interest. Such a result, however, may be the outcome of observations by Mr. George Balfour (the only expert in electric traction on the Committee) and Mr. Kennedy Jones, the chairman. During the examination of Mr. Watson, representing the London Tramway and Vehicle Workers' Union, the witness was asked by the chairman to explain his suggestion that the railless trolley car should have a fair trial, and his reply was that such vehicles had been successful in Germany. The witness might have added that the car had also justified itself in Austria and in this country.

Mr. Balfour is reported to have asked if the witness knew that the trolley omnibus "had been tried in Dundee, in Leeds, and other places, and had failed." Mr. Watson's reply was that he "did not know that," Mr. Balfour adding "Then you may take it from me that they have." Whereupon the chairman observed, "And the London County Council tried such omnibuses without success and abandoned them." The statements made by the two members may have the injurious effect of restricting, unfairly, the resources of traffic undertakings. High prices having made tramway construction exceedingly costly, it is important that an alternative system which can be carried out at a reasonable expenditure should not suffer from unjust aspersion. The field of promise for the railless trolley vehicle became clearly marked before and during the war, and its practicability has induced engineering experts to undertake contracts for fitting up routes with the overhead cables and for construction of the conveyances. No better justification for their enterprise can be desired than the experience of the Keighley tramways department. There the railless trolley car under severe conditions has proved reliable and economical in working. So far from the trolley omnibus having resulted in failure at Leeds, Bradford, and Dundee, the facts are to the contrary. We have the authority of Mr. Peter Fisher, general manager of Dundee Corporation Tramways, for stating that

(1) A short experimental portion of a route was equipped for this form of traction, and two cars were provided to work it.

(2) The road was most unsuitable for such traffic, but the Works Committee of the Corporation had made provision in their estimates for bottoming and improving this road. When the tramways department erected the overhead equipment, the works department refused to carry out their intention of spending money on the roads, and called upon the Tramways Committee to do so. The Tramways Committee refused, and ultimately resolved to give up running the service rather than undertake the road-building. The road was not suitable for ordinary traffic, not being bottomed and otherwise a weak road.

(3) There never was any distinct report on the abandonment of the project; the above are the particulars.

(4) The experiment was a complete success so far as the efficiency of the vehicles were concerned, and the financial results were quite satisfactory.

Other places where use is being made of the railless trolley system include Rotherham and Aberdare, while York is about to have an installation. As for London, there is no trace of a trial ever having been made. The railless car's great merit is that it induces traffic, and that when the volume justifies the laying of rails the overhead equipment is already in existence.

PRICE OF HOME-PRODUCED BENZOLE.

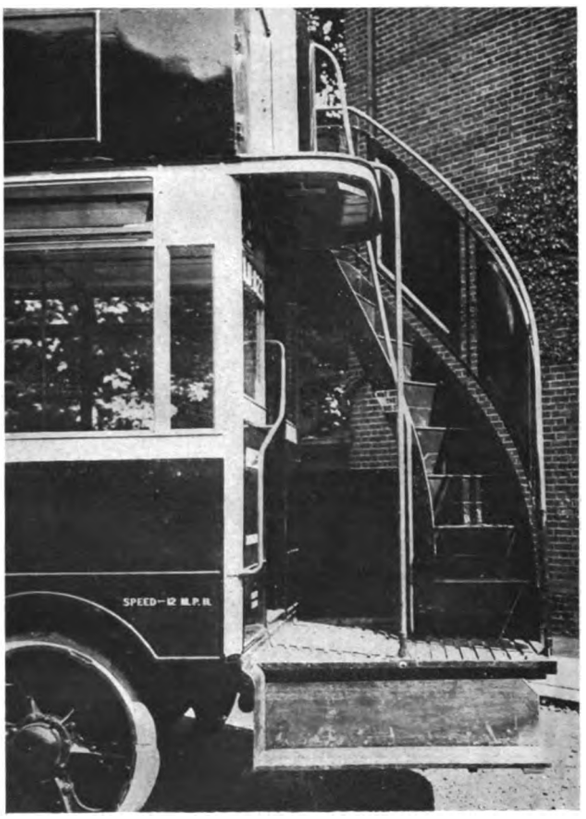
"Now that there is a possibility of Great Britain producing its own motor spirits," said Mr. Joynson-Hicks at the annual meeting of the Automobile Association and Motor Union, "it is desirable that motorists should do all they possibly can to increase the consumption of home-produced fuels in preference to imported spirit." Benzole had proved to be practically as useful as petrol, and they were advising members to run their cars on home-produced benzole rather than on imported petrol. Benzole producers should not content themselves with underselling petrol by 1d. or 2d.; they must aim at cutting the price to something like the cost of petrol before the war. Last year the Association spent £3,566 on a fuel campaign.

REPORT ON GAS FOR FUEL.

The report of the Inter-departmental Committee on the employment of gas in substitution for petrol and petroleum products as a source of power, issued on July 29, as a White Paper, states that the gas motor merits adoption as a commercial alternative to electric, petrol, or steam traction, especially for road vehicles, including tramway cars. The average traction equivalent of one gallon of petrol is 250 cubic feet of ordinary town gas.

Gas bags, it is stated, should be generally superseded by semi-rigid or rigid containers, wherever compression plant can be installed. It is, however, considered inexpedient, having regard to the uncertainties which surround the future supply of liquid-fuel supplies, that existing facilities for gas traction service should be either abandoned or dismantled.

The cost of compressing town gas into cylinders, inclusive of maintenance of compressor plant, storage cylinders, and vehicle cylinders, and of interest and depreciation on the capital sums



Rear Platform of New L.G.O.C. Omnibus.

required, will vary between 1s. 8d. and 3s. per 1,000 cubic ft. of free gas, according to quantity required and working pressure adopted, the total cost involved being on the average equivalent to 7d. per gallon on any petrol replaced.

TRIPLEX SAFETY GLASS APPROVED FOR CABS.—In reply to a letter in regard to the use of Triplex safety glass in substitution for ordinary glass at present used on public vehicles, the Commissioner of Police for the Metropolis has informed the Triplex Safety Glass Company, Limited, that the police will raise no objection to its use in cabs.

OMNIBUS MAY SUPERSEDE TRAMWAY.—Lancaster Town Council has not been able to make tramways pay, and at the last meeting they were faced with an addition to the already large deficit. Mr. T. Wilkinson reported that the Tramways Committee were bound to undertake immediately the expenditure of £4,000 to put the track into proper order, and in view of a probable deficit equal to a rate of 6d. in the £, the whole question of substituting omnibuses should be considered. A special committee was appointed to consider the question.

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MOTOR TRAFFIC

THE NEW LONDON OMNIBUS.

Representatives of the press recently had an opportunity to inspect the first omnibus of the new type that the London General Omnibus Company expect soon to put into regular service. Drawings and a brief description of the new vehicle, which has been constructed by the Associated Equipment Company, were given in our issue of July 17. As then mentioned, the most notable features are that the seating accommodation is twelve more than in the present omnibus, and that the floor is lower and therefore more convenient for entering and alighting.

The new vehicle has seating accommodation for 46 passengers, 22 inside and 24 outside. Eight of the seats inside face forward, but there are two longitudinal seats at the end, each seating three passengers. The additional space inside is obtained by extending the front of the body to the position hitherto occupied by the dash-board, and by bringing the sides of the omnibus straight down. This gives the vehicle an appearance somewhat similar to that of a tramcar. Another improvement is the greater space on the rear platform, which has been increased from 3 ft. to 3 ft. 10 in.

Side View of New Type of L.G.O.C. Omnibus Constructed by the Associated Equipment Company.

in length, so that passengers are enabled to get on and off simultaneously.

Although the seating capacity has been increased, the weight of the omnibus is not more than that of the existing type, viz., 3 tons 10 cwt. The engine is placed at the left-hand side, so that a seat is provided for the driver on the right. The engine is of 30 H.P. (100 mm. × 140 mm.). The engine speed is higher, but the worm-driven rear axle is of a lower gear. The clutch is of the Ferodo plate type.

Over all the length of the omnibus is 22 ft. 6½ in., an addition of only a few inches. Special attention has been given to the springing, and the vehicle runs with noticeable smoothness. It is comfortably upholstered inside, and is electrically lighted. Communication between the conductor and the driver is by an electric bell.

The new omnibus is being subjected to exhaustive tests, and in due course it will no doubt be given official approval. When all arrangements are completed, it is expected that construction will proceed at the rate of fifty vehicles a week.

THE GREAT WESTERN RAILWAY have placed an order with the Associated Equipment Company, Limited, for another 50 chassis. This is in addition to the 21 chassis ordered in February last.

ADVANTAGES OF ELECTRIC HAULAGE.

The advantages obtained by the Bournemouth and Poole Electricity Supply Company with a 5-ton G.V. electric tipping wagon in comparison with two steam wagons for the haulage of coal and clinker are given as follows in the *Electric Vehicle*, the journal of the Electric Vehicle Committee of Great Britain :—

Time Saving.—No time is lost in taking in water, clinkering fires, recovering steam after hill climbing, etc. The drivers are not required to come early to get up steam or to work overtime in washing out boilers, cleaning down engines, etc.

Manœuvring.—The ease of operation and control makes manœuvring in and out of yards, etc., very simple and rapid.

Tire Wear.—The wagon has not been in use long enough to provide definite data, but it is very obvious that the wear on the rubber tires is very considerably less with the electric vehicle than with the steamer, though the gross weight is more. This is attributed to the easy and gradual starting up, which is free from jerks.

Reliability.—Here again the wagon has not been in use long enough for comparison, but in the six months of operation it has called for no repairs whatever, and the battery maintains its full capacity.

Power.—With a full load of 5 tons up, this vehicle takes an average of 2·38 units per wagon-mile in the wet weather and on the hilly road over which it operates. The average units out and home are 1·99. The average power taken over these roads on a measured journey (dry weather) with 4 tons 4 cwt. up, exclusive of driver, etc., was 4·86 KW., the maximum was 16·8 KW., and minimum (on the flat), 3·5 KW. The average speed out and home, including stops and discharging load, was 4·6 miles per hour, but, as the round trip was only 90 minutes, this is not a criterion of what the wagon can do normally. Its normal speed on a flat road is at least 10 miles per hour.

AMERICAN MOTOR SHOWS.—The National Automobile Chamber of Commerce has fixed the New York and Chicago motor truck shows for the same dates as the passenger car exhibitions in each city. The New York show will be held from January 3 to 10, at the 22nd Regiment Armoury, 168th Street and Broadway. The Chicago show will be held from January 24 to 31 in the Drexel Pavilion. Mr. S. A. Miles will be manager of both shows.

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MOTOR TRAFFIC

MOTOR VEHICLES FOR MUNICIPALITIES.

BERWICK COUNCIL have purchased an ambulance.

BRISTOL CORPORATION have purchased four lorries.

BATLEY COUNCIL are purchasing a motor fire engine.

PAIGNTON URBAN COUNCIL have ordered a steam lorry.

LUTON COUNCIL have agreed to purchase two motor vehicles.

TORQUAY COUNCIL have decided to purchase a steam fire engine.

BIRMINGHAM CORPORATION are obtaining a car for the fire brigade.

CLUTTON RURAL COUNCIL have placed an order for a motor lorry.

GLOUCESTER RURAL COUNCIL have decided to obtain a 4-ton steam lorry.

HESTON URBAN COUNCIL have purchased two Government motor lorries.

HATTON URBAN COUNCIL are obtaining three Edison electric vehicles.

BURTON-ON-TRENT COUNCIL have decided to purchase a motor fire engine.

CITY OF LONDON CORPORATION are purchasing a motor car at a cost of £600.

WALLSEND COUNCIL have called for a report on electric wagons for refuse removal.

WALTHAMSTOW COUNCIL have purchased five steam wagons from the Government.

NEWCASTLE-UNDER-LYME COUNCIL have invited tenders for a motor fire engine.

LEEDS CLEANSING COMMITTEE are purchasing a Lacre motor road sweeper for £578.

CHORLEY TOWN COUNCIL have decided to buy a motor fire engine at a cost of £1,240.

GRIMSBY CORPORATION propose to purchase two motor vehicles for hospital purposes.

HARROGATE TOWN COUNCIL are asking for a loan of £877 for the purchase of a motor lorry.

CARNARVON COUNTY COUNCIL have empowered their surveyor to purchase motor vehicles.

SOUTHGATE COUNCIL have resolved to obtain three battery vehicles for refuse collection.

WIGAN CORPORATION are applying for a loan of £4,617 for the purchase of three omnibuses.

STIRLING COUNTY COUNCIL are purchasing a car for the road surveyor of the central district.

LEIGH RURAL DISTRICT COUNCIL are borrowing £1,715 for the purchase of three motor lorries.

NEWPORT (MON.) COUNCIL have adopted a report approving of electric vehicles for refuse collection.

IPSWICH CORPORATION have placed an order with Messrs. Dennis Bros. for a motor fire engine at £1,500.

RUSHDEN COUNCIL have applied for sanction to a loan for the purchase of a battery-propelled wagon.

ST. PANCRAS COUNCIL are considering the question of carting refuse collection by mechanical traction.

SURBITON URBAN DISTRICT COUNCIL have obtained a loan of £1,114 for the purchase of an electric dust van.

PRESTATYN COUNCIL have sent a deputation to inspect a Straker-Squire lorry belonging to Birkenhead Corporation.

SWANSEA CORPORATION have ordered two 5-ton steam wagons, rubber-tired, from Fodens, Limited, at £1,260 each.

NORTHALLERTON RURAL COUNCIL are considering the question of purchasing a tractor and two trucks for haulage work.

CANTERBURY TOWN COUNCIL are to purchase a petrol motor vehicle for the cleansing department at a cost of £1,304.

HETTON URBAN DISTRICT COUNCIL have decided to buy three electric vehicles, and provide a garage, at a total cost of £6,000.

ALFORD DISTRICT COMMITTEE of the Aberdeenshire County Council have resolved to purchase a steam tractor and wagon.

OLDHAM CORPORATION are applying for sanction for a loan of £4,000 to purchase a steam wagon, electric vehicle, and gully emptier.

WILLESDEN URBAN COUNCIL have decided to purchase an electric vehicle from the electricity department from Messrs. Ransomes, Sims and Jeffreys.

PLYMOUTH CORPORATION have agreed to purchase two steam rollers and four 3-ton steam wagons, fitted with interchangeable 800-gallon tanks, for street watering.

PRESTON CORPORATION have accepted the tender of Messrs. Drake and Gorham, Limited, for the supply of two electric vehicles for the cleansing department, for the sum of £2,664.

BROADSTAIRS COUNCIL have obtained two 5-ton Foden steam wagons at £550 and £540 from the Government depot at Richborough. £120 is to be expended on renovations to each wagon.

EDMONTON URBAN COUNCIL have asked for sanction to borrow £10,000 for purchasing five electric wagons, with charging plant, for refuse collection, and two Ford vans and a motor brougham.

MIDDLESEX COUNTY COUNCIL have been advised by a committee to hire a motor car for three months, as it is not advisable to purchase a car because prices are expected to fall in the autumn or winter

EDMONTON URBAN DISTRICT COUNCIL, which recently decided to introduce electric vehicles in the cleansing department, are seeking sanction for a loan of £8,500 for the purchase of five electric vehicles and the provision of garage accommodation.

BIRMINGHAM CORPORATION have been recommended by the Salvage, Stables, and Lighting Committee to purchase 25 Edison Accumulator wagons for refuse removal at a cost of £32,000, and to instal charging plant at a dust destructor yard at a cost of £2,000.

ILFORD COUNCIL find that the cost of collecting house refuse has risen from 3s. 9d. per load before the war to 12s. 11d. last year, and they have asked the surveyor to prepare a report on the question of motor traction for that purpose, and to ascertain the experiences of other authorities in this connection.

DURHAM COUNTY COUNCIL propose to purchase two four-seat cars, one for the county surveyor and the other for general use. From the War Department they are purchasing ten Foden steam wagons at prices ranging from £549 to £590. These are in good condition, but some slight repairs are necessary.

HACKNEY COUNCIL have been recommended by the Works Committee to obtain four electric vehicles at a cost of £7,300, including charging plant. The committee have inspected the vehicles in use in various towns, and have reported that the use of electric vehicles for dust collection will result in a saving of £3,000

ILKESTON HIGHWAYS COMMITTEE have received a report from a deputation that, after inspecting the steam wagons at Litherland Camp, and attending the sale by auction, they had decided that the prices asked were not such as to warrant purchase. The deputation were asked to continue in being until the purchase of a steam wagon is concluded.

HOVE CORPORATION have been recommended by the Sanitary Committee to order four battery wagons from Edison Accumulators, Limited, at £1,304. The vehicles are fitted with steel bodies and automatic tipping gear, and are to be delivered by next Christmas. It is also proposed to continue for a year the contract with Tillings, Limited, for the hire of four steam wagons.

HAMMERSMITH COUNCIL, after making inquiries in other boroughs, have decided that it is more economical to use motor traction than horse transport for street watering, general haulage, etc. They propose to order two 5-ton steam wagons from the Mann Patent Steam Cart and Wagon Company, fitted with mechanical working gear, at £1,340 each. The fittings include a watering tank holding 150 gallons, and a 1,000 gallons interchangeable street watering tank.

BETHNAL GREEN COUNCIL are adopting motor vehicles for dust collection and street watering, and the Works Committee recommend that the tender of John I. Thornycroft and Company, Limited, of No. 10, Grosvenor Place, S.W.1, be accepted for three model "J" 40-H.P. motor chassis with tipping wagon body, cab, watering body, machine brush, additional shafts, fine sprinkler attachment, speedometer, and registration, complete with tools and accessories, for £1,347 11s. each, and that the tender of Hezeldine Brothers, of Southwark, be accepted for two trailer wagons, with tipping gear, for £165 each.

MOTOR CAR LICENCES.

In the House of Commons on July 23, during the consideration of the Finance Bill, Colonel Gretton moved a new clause, providing that excise licences for motor cars taken out in the course of a year should be payable only in proportion to the part of the year to elapse after they were taken out.

Mr. Chamberlain said he did not think the grievance was as widely felt as Colonel Gretton supposed. By the proposal the revenue would lose, because the owners of luxurious touring cars would only take out a licence during the summer months.

The amendment was withdrawn.

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MOTOR TRAFFIC

MOTOR TRAFFIC NOTES.

ADDITIONAL OMNIBUSES FOR HALIFAX.—The Tramways Committee have authorised the vice-chairman and the tramways engineer to purchase four motor omnibuses required for new services.

MECHANICAL TRANSPORT SALES.—Up to July 25 the total of the mechanical transport vehicle sales held under the auspices of the Surplus Stores Board had realised £1,739,000. The largest sum received in one week was £272,096.

MEMBERSHIP OF A MOTOR ORGANISATION.—It was reported at the annual meeting of the Automobile Association and the Motor Union that the membership now exceeds 90,000, and that it is hoped to increase it to 100,000 ere long. The income last year totalled £59,331.

WELLINGBOROUGH OMNIBUS COMPANY.—The past year's working resulted in a profit of £4,353; which, together with £699 brought forward, makes a total available for distribution of £5,053. A final dividend of 15 per cent. has been paid, together with a bonus of 2s. per share, leaving £1,053 to be carried forward.

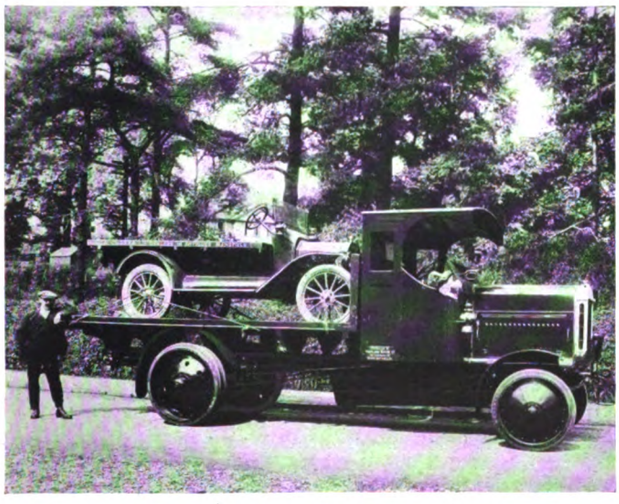
OMNIBUS FARES IN A TRAMWAY AREA.—At the request of Bournemouth Corporation, the Bournemouth and District Motor Services, Limited, have raised their fares in the tramway area 50 per cent. above the car fares. As a condition of granting licences to the Lymington Motor Company, a similar stipulation has been made.

BIRKENHEAD OMNIBUS SERVICE.—The tramways department has inaugurated a motor omnibus service. The first vehicle received from the Leyland Company was inspected by the Mayor and members of the Tramways Committee. It has seating accommodation for 33 passengers, 10 accommodated in the smoking compartment.

PENNY AN OMNIBUS MILE.—Swansea Corporation have granted permission to Mr. J. H. Sears to run a motor omnibus service from the borough boundary to Forestlash, subject to the payment of a penny per omnibus mile, for a period of twelve months only, and subject also to any other permission or licence that is necessary being obtained.

ARMY LORRIES FOR PASSENGERS.—In connection with the loss of thirty shillings a day per vehicle which the London General Omnibus Company are experiencing in running army lorries for the conveyance of passengers, Mr. Higham recently asked for a statement as to the financial terms granted by the Government. The reply was that the arrangements had not yet been settled.

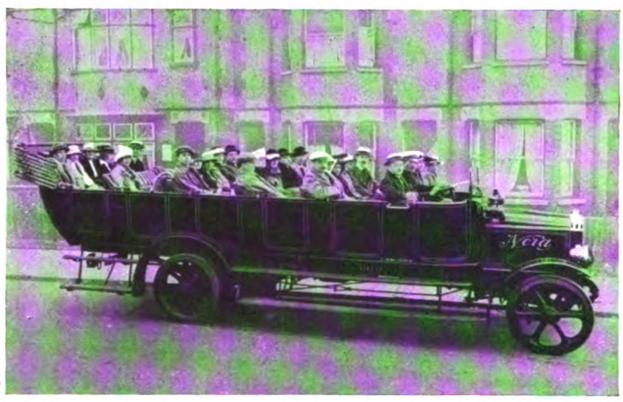
THE RESTRICTION OF MOTOR IMPORTS.—It is stated that the Board of Trade are considering the question of allowing the importation of increased numbers of 30 cwt. commercial vehicles and private cars. The restriction of the imports of utility cars and chassis to 50 per cent. of the amounts imported in 1913 ends on September 1 next. The regulation does not impose any duty.



A Leyland Lorry.

CONTINENTAL DUTIES ON CARS.—Since the war the deposits which have to be paid by motor car owners landing their vehicles in Continental countries have been greatly increased. In France it is 70 per cent. of the value of the car. The Automobile Association have made arrangements by which the owner can lodge a banker's guarantee with the association, which in turn will make the deposit in cash at the Continental port of entry.

LUTON TO ABERYSTWYTH BY CHARS-A-BANCS.—The accompanying photograph of a Commer Car chars-a-banc was taken just as the vehicle was about to leave Luton, the home of "Commercial Cars," for Aberystwyth. The vehicle had been specially chartered for Commercial Car employees from the owner, who had been for about nine years a driver in the employment of Commercial Cars, Limited. The vehicle has seats for 30 persons.



A Holiday by Commer Car Chars-a-banc.

THE LAW RELATING TO TRAILERS.—The restrictions placed upon the use of trailers for commercial motor vehicles by the Motor Car Acts call for speedy amendment. In the United States trailers are in general use at higher speed than in this country. During the war the British regulation was commonly broken by vehicles belonging to the Ministry of Munitions and the Royal Air Force. The regulation imposes a speed of five miles an hour, no exception being made if the tractor and trailer are both fitted with rubber tires.

PRICES OF GOVERNMENT LORRIES.—The following were among the prices obtained for Government lorries at an auction sale at Olympia on July 29:—Three-ton Stevens petrol-electric, 1,150 guineas; 3-ton Peerless, 650 to 725 guineas; Associated Equipment Company lorry chassis, 800 to 900 guineas. Ten Sideley-Deasey car chassis each sold for 450 guineas. Three Rolls-Royce cars, fitted with body and accessories, fetched 2,100, 3,050, and 3,250 guineas, while 1,325 guineas was paid for one chassis and 2,150 for another.

DERBYSHIRE COUNTY COUNCIL AND GOODS HAULAGE.—The County Council of Derbyshire have had under consideration the question of constructing light railways. Colonel Gray has suggested that instead of adopting a scheme for light railways the Council should take into consideration the inauguration of a system of road lorries for the transport of merchandise and agricultural produce, leaving the passenger traffic to be dealt with by omnibuses. Arrangements could be made with the Disposal Board for the purchase of the vehicles required.

MOTORS FOR U.S.A. ROAD CONSTRUCTION.—Up to June 5 a total of 5,336 motor trucks had been given by the Department of Agriculture to 46 States in the U.S.A. to be utilised for road construction. Title to these trucks will be vested in the States which use them, but they will be turned back to the Department of Agriculture as soon as their usefulness for road work is ended. The State has no right to sell them, and in the event of their being ready for the scrap-pile a joint board of State and national representatives will consider condemnation proceedings.

CAR OWNERS AND THE TRANSPORT BILL.—Addressing the annual meeting of the Automobile Association and Motor Union, Mr. Joynson Hicks referred to the Ways and Communications Bill, which he claimed had been improved in the House of Commons by the creation of an Advisory Committee to co-operate with the Minister. He thought it would be unsafe for Sir Eric Geddes or any other Minister under the Bill to hug the delusion that the Committee was only advisory. The annual financial statement showed that a sum of £5,810 was expended last year towards a motor legislation campaign.

TAXATION OF HEAVY VEHICLES.—The suggestion has been made by the West Riding County Council that, having regard to the large increase in the number of heavy motor and steam-driven vehicles under five tons in weight, and the damage which they cause to roads, the owners should pay an annual licence fee. The subject

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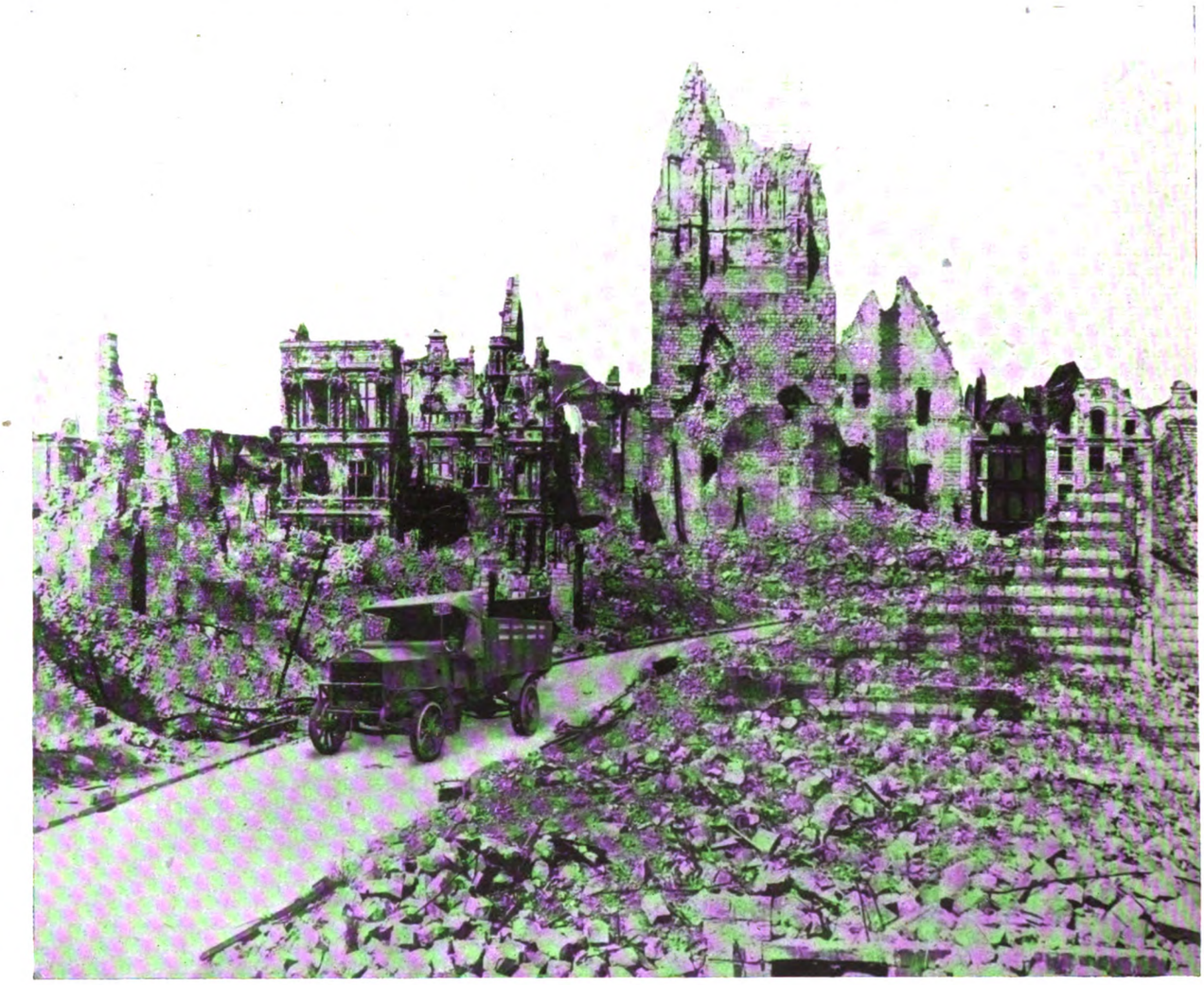
MOTOR TRAFFIC

has been considered by the County Councils Association, which has suggested that the question of the taxation of heavy vehicles should be considered by the promised Joint Select Committee of both Houses of Parliament, and that this Committee should be set up at the earliest possible date.

CHARS-A-BANC TOURS.—Messrs. Pickford, Limited, the goods carriers, have taken up the business of conveying passengers for chars-a-banc tours. The longest tour is from London to Devon and Cornwall, which takes twelve days for 725 miles, the inclusive charge being 17 guineas. The firm give a choice of seven separate tours, which vary in distance, time, and charges accordingly. The vehicles used are the Tillings-Steven petrol-electric, fitted with rainproof hoods, and they accommodate 29 passengers, but in order to prevent overcrowding the load is restricted to 22. There is a space of 3 ft. 3 in. between the seats, thus avoiding a cramped position.

TILLINGS LIMITED OFFER A RENTAL AT BRIGHTON AND HOVE.—A movement having set in among the members of the Brighton Corporation to secure the working of the motor omnibus service of Messrs. Tillings, Limited, by the tramways department, the company have discussed the matter with representatives of the authority. The outcome of the meeting was an offer by Messrs. Tilling to take a lease for seven years of the motor omnibus powers of the Brighton and Hove Corporations, and to pay to each authority £40 per omnibus up to the minimum number of fifty, and £20 per each additional vehicle licensed, subject to the execution of a lease on the lines of a draft agreement discussed in 1916, the arrangement to date from July 1, 1919.

IPSWICH AND OMNIBUSES.—Consideration has been given by Ipswich Tramways Committee to future requirements in transit facilities, and whether omnibuses should supersede the tramway system. The Mayor (Councillor Ransome) informed the Council that omnibuses had nowhere been used in substitution of tramways, but were used to supplement tramways and as feeders. Councillor Reavell remarked that the repayment of capital and interest on the tramways undertaking would still cost £5,657 per annum for 25 years if omnibuses were adopted in place of the cars, and there would be the further expense of removing the rails and making up the roads. The Council adopted the committee's recommendation for improving the tramway service by relaying sections in double track in place of the existing single track.



A Napier Lorry among the Ruins of Arras.

FILMS FOR HIGHWAY DEVELOPMENT.

Cinematograph pictures are to be used in the United States by the Government through the Visual Instruction Section of the Department of the Interior to further highways construction, highways safety and other matters of national interest. The National Automobile Chamber of Commerce has been requested to secure films from the manufacturers and furnish them to the Department of the Interior for this work. Distribution of the films, it is expected, will be made through various university extension divisions, boards of education, etc. Films will be distributed free by the Government. The projectors are to be purchased by the individual community, which may, if necessary, arrange series of benefit programmes in order to raise necessary funds.

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THE
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SATURDAY, AUGUST 16, 1919.

RIGHTS AND WRONGS OF TRAMWAYS.

Up till recently neither the public nor the tramway authorities have been quite aware of the importance of tramways to the well-being of the community. Out-of-date writers in newspapers still talk as though the tramways were the substitute for walking adopted by a self-indulgent generation, which could easily dispense with it by returning to the sterner habits of former days. No grosser superstition ever clouded the intelligence of human beings; it is a figment of the imagination which the facts of stern necessity contradict every day. For instance, let a tramcar obstruct a busy route in any town in the Kingdom for only half a day, and the result is dislocation of the business life of the whole community, with consequent losses in wages to workpeople and business to traders and manufacturers. Tramway authorities are too well acquainted with that fact, and yet have not been altogether free from sycophancy to the superstition, assuming rather the humility of the courtier seeking favour than the bearing of the giver of benefit. Of course, as practical men intent only on getting work done, tramway managers would prefer to ignore public opinion, superstitious or enlightened, and the lowly position of the tramway industry in public esteem is partly due to this attitude of sturdy independence. Neither ignoring nor truckling to popular opinion, however, will serve, and it is satisfactory to note that the spokesmen of tramway interests are at length recognising both the value of publicity and the necessity for speaking out. Mr. Madgen in his paper read at the recent conference laid bare the factors in the fares question with an incisiveness which cut away all extraneous and confusing considerations, demonstrating the right of tramway undertakings to the means of carrying on their work. Mr. England's paper formed what may be roughly described as the popular addendum to Mr. Madgen's main thesis. The former expressed the convictions which have been growing in the minds of tramway authorities and tramway managers for these past five years or more. Tramway undertakings have rights and they have suffered certain wrongs. They have the right to demand that they shall be supplied with rolling stock and appliances suited to their needs; to adequate financial support, and to payment for service. On the wrongs of the tramway industry, Mr. England was equally clear. He exposed the unfair burdens imposed on tramways by the levying of local rates, and by saddling them with the cost of improving and maintaining streets and roads along which tramway tracks are laid. Every tramway man knows that his traffic only wears the track rails and the foundations of the track, and yet local authorities have been allowed to assume that the tramway is responsible for the wear and tear of the whole traffic of a thoroughfare. Again, it has not been sufficiently borne in upon the tramway passenger's mind that his ride costs money in power-drive, tramway labour, tickets, and wear and tear of rolling stock and track, and it must be paid either by the fare or the local rates. If the expression may be permitted, it may be said that the tramway industry is discovering itself, seeing clearly what it is, what its needs and rights are. If this mind can be communicated to the general public, the gain will be great, not only to tramway undertakings, but to the whole community.

LIVERPOOL STRIKE SETTLED.

STATEMENTS BY THE CHAIRMAN AND THE MEN'S REPRESENTATIVES.

After a lengthy conference between a sub-committee of the Liverpool Corporation Tramways Committee and the National Amalgamated Workers' Union, it was announced late on the evening of Friday, August 8, that terms of settlement had been reached. The following signed statement was issued :—"Mr. Tevenan stated that the men were prepared and willing to resume work on pre-strike conditions. The chairman stated that the question of sixty hours' pay for forty-eight hours' work will, in accord with the promise of the 27th June, 1919, be considered at the next meeting of the committee on the 29th inst. The committee declined to have any further negotiations with Mr. Daniel; negotiations (if any) hereafter to be conducted between the general manager and Mr. Tevenan, the general secretary.—E. RUSSELL-TAYLOR (Chairman of the Tramways and Electric Power and Lighting Committee), P. J. TEVENAN (Joint General Secretary), C. MAHER (Chairman of Executive), T. WILLIAMSON (District Secretary of the National Amalgamated Workers' Union)."

Subsequent to the conference, a crowded meeting of tramway men on strike was held at the Picton Hall, Mr. James Healy presiding. Mr. Tevenan reported the result of the conference with the sub-committee of the Tramways Committee. He said he made it clear that in any settlement made there must be no victimisation. He appealed to the men to loyally accept the decision which had been arrived at, and to return to work early the next day, so as to provide an adequate service of cars for the city. The acceptance of the terms which had been arranged by the representatives of both sides was then put to the vote, and was carried by an overwhelming majority.

Mr. Russell-Taylor, Chairman of Liverpool Tramways Committee, sent to the Press a statement controverting some of the main assertions made by the tramwaymen's representatives in justification of the strike. Mr. Russell-Taylor says that the mendacious statement as to the reduction of £1 per week in the pay of the tramway employees was circulated with the obvious intention of misleading the public, and forming some sort of justification for the unauthorised strike.

The Chairman of the Tramways Committee challenges his opponents to deny that the wages of many of the tramway employees have for a long time past amounted to £5 10s. per week, and that the only reduction made was the discontinuance of the overtime, which brought their wages up to this amount. The necessity for working this overtime was caused by the shortage of men owing to war conditions.

He further refers to the statement made by the tramwaymen's representative in the local Press that overtime was worked contrary to the wishes of the M.E.A. This is absolutely untrue, as the M.E.A., continues Mr. Russell-Taylor, applied on the 11th April, 1919, asking the Tramways Committee not to put the eight hours' day into operation. Notwithstanding this however, they agreed to receive overtime rates for any time worked above eight hours per day, but as soon as sufficient demobilised soldiers and sailors were available, and this overtime was discontinued, the Municipal Employees' Association struck work, and made the false statement that their wages were reduced by £1 per week, as a pretext to strike.

Edinburgh Tramway Receipts.—The Edinburgh Corporation took over the working of the tramways on July 1st. For the four weeks ended August 2nd, the traffic receipts amounted to £62,288, an increase of £13,430 over the four corresponding weeks of last year. The traffic receipts for the week ended August 2nd, amounted to £11,553 7s. 0d., an increase of £1,619 12s. 1d.

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LIGHTS ON VEHICLES

In view of the recent revocation of the Lights (Vehicles) Order and the Lights (Driving of Animals) Order, the Commissioner of Police of the Metropolis has issued a memorandum showing the provisions of the law as it now exists on the subject of lights on different vehicles. :—

LIGHT LOCOMOTIVES (MOTOR CARS).—One lamp must be carried on the extreme off-side free from all obstruction to the light, and it must be lit between one hour after sunset and one hour before sunrise, and show a white light to the front and red to the rear. During similar hours a lamp should be kept burning so as to illuminate the identification mark fixed on the back of the vehicle.

PUSH BICYCLES AND TRICYCLES.—Pedal cycles have to carry a light between one hour after sunset and one hour before sunrise.

PUBLIC CARRIAGES.—Stage carriages must have a lamp inside properly lighted between sunset and sunrise. Cabs must carry between one hour after sunset and one hour before sunrise a lamp properly trimmed and lit so as to exhibit a white light to the front. If only one lamp is carried it should be on the off-side.

HORSE-DRAWN VEHICLES.—One lamp showing a white light to the front must be carried between one hour after sunset and one hour before sunrise. If there is only one lamp it must be on the off-side and any light visible from the rear must be red. If there are loads projecting more than 6 ft. to the rear, the vehicle must have a lamp showing red to the rear. County councils have power to make orders exempting vehicles used for the purpose of harvesting from the provisions of the Act. The Act does not apply to any vehicles drawn or propelled by hand.

MISCELLANEOUS NEWS AND NOTES.

Railway Unrest.—The Associated Society of Locomotive Engineers and Firemen have intimated to the Government that failing a settlement this week they may not be able to restrain the men any longer.

Later Tramcar Service.—London United Tramway Company has arranged that the last car shall leave its Shepherd Bush terminus at midnight on Sundays, instead of at 11.30. p.m.

Proposed Motor Omnibuses for Yarmouth.—Yarmouth Town Council propose to apply for a provisional order authorising a service of motor omnibuses over the tramway and other routes.

Darlington Tramway Extension Proposals.—At a recent meeting Darlington Council decided to take steps to obtain Parliamentary powers to extend the Corporation Tramways system into the Hopetown district.

Increased Fares at Hull.—After a keen discussion, Hull City Council sanctioned the increased tram fares and the adoption of the stage system, proposed by the Tramways Committee. The changes take effect from Monday, August 11.

Clyde Valley Service Stopped.—Owing to a breakdown at the Clyde Valley Electrical works, the tramway service between Dalmuir and Balloch stopped last Saturday morning, and was suspended for a considerable part of the day.

New Company.—A private company, with 20,000 shares of £1 each, has been floated to construct light railways in Bedfordshire, Buckinghamshire and adjoining counties. The address is 20, Bridge Street, Leighton Buzzard.

Flight by Man-Power.—It is reported from Paris that the French cyclist, M. Poulain, has succeeded in covering a distance of 12 metres at a height of 1 metre from the ground, on a man-driven aeroplane, attaining a speed of 45 kilometres per hour.

Extension of Time.—Bristol Tramway Act, 1915, has been extended by the Board of Trade until June 24, 1920. The Board has also extended for a year the Swansea Corporation Act, 1912, for the completion of tramway extensions.

Employees' Holidays at Bury.—The Town Council has granted six days' holiday yearly, including Christmas Day, New Year's Day, and Good Friday, with pay, to the skilled men employed in the tramway depot.

Price of Tramway Electricity Supply Raised.—The Electricity Department of Dundee Corporation has raised the price of electric supply to the Dundee, Broughty Ferry and District Tramways Company, from 1.25d. per unit to 1.75d. per unit plus 10 per cent.

A Gateshead Car Runs Away.—Owing to the steep incline at Sedhouse Bank, Low Fell, Gateshead, a tramcar got out of control, and collided violently with a motor trolley proceeding in the opposite direction. Both trolley and car were severely damaged, but no one was hurt.

Cairo Tramway Strike. A *Times* telegram says that the delegates of the tramway employees and representatives of the company went to Alexandria on August 12 to lay their respective cases before the Prime Minister.

Forty-Eight Hours' Week at Dublin.—The Dublin United Tramways Company has arranged for a forty-eight hour week for the employees, entailing a reduction of twelve working hours in the week. Sunday work will be paid for at overtime rates, and there will be one free day in seven.

York Corporation has applied to the Board of Trade for an extension of the amount to be borrowed under the Yorkshire Light Railway Orders from £186,055 to £203,550. Of this amount £17,400 is required for the purchase of new cars, £2,150 for overhead work, £3,997 for special work, and £1,253 for amounts already spent.

Maidstone Tramway Extensions Deferred.—Maidstone Town Council has deferred for a year the scheme for the construction of tramways through the North Ward to Chatham. The estimate for the work at present is £233,000. This compares with the estimate before the war of £129,800.

Belgian State Contracts.—The "Bulletin Commercial" of the Belgian Ministry of Foreign Affairs announces that applications for specifications, plans, etc., relating to tenders invited by the Belgian State Railways and by the Docks and Harbours and Post and Telegraph Authorities should be sent to the "Chef du Bureau des Renseignements concernant les Adjudications Publiques," 15, Rue des Augustins, Brussels. Plans and models relating to these adjudications are also on view at that office.

Silver Badges to Long Service Men.—Silver badges have been presented to 99 men of the uniform staff of the Glasgow Corporation Tramways who have completed 25 years' service.

Portsmouth Municipal Touring Car.—Portsmouth Tramways Committee recently purchased a touring car. This is well patronised by visitors, and is seldom run without its full complement of passengers.

Women Displaced at Manchester.—From about 880 women and 250 girls employed on Manchester Corporation Tramways, the number has now been reduced to 24 women conductors on the cars and about a dozen trolley girls. It is expected that no women will be on the Manchester outdoor tramway staff within about two weeks.

Accident at Heysham.—A serious accident occurred at Heysham, near Morecambe, on August 12. The gear pin of one of the Morecambe Tramway Company's petrol cars came out; the driver was unable to stop, and it ran past a loop and crashed into a car coming from Heywood. Both cars were damaged and a number of people received injuries.

The Tramways and Light Railways Association.—The Journal for August contains the papers on "Notes on Tramway Fares and Services," by Mr. W. L. Madgen, and on "Tramway Problems," by Mr. H. England, which were read at the conference on July 25, together with the chairman's report on the work of the Association for the past year.

Patent and Designs Bill and the Trade Marks Bill were read a second time in the House of Lords on Thursday. The consideration of the measures in Committee was postponed until the autumn sittings. The Lord Chancellor said that as the Bills dealt "with matters of some little importance" their lordships wished for time to give attention to them.

Underground Railway Gardens.—The Underground Railway authorities continue to encourage their staff to cultivate the gardens at the stations. The annual inspection of the gardens has just been made by a committee of directors, assisted by officials of the company, and prizes amounting to £28 have been awarded. The first two prizes of £3 each have been awarded to inspectors at the Northfields and Boston Manor stations.

Attempted Pocketpicking on Tramcars.—At Birmingham Police Court, three men were charged with loitering with the purpose of picking pockets. It was alleged that they were seen to board a tramcar, and two of them jostled a man while the other tried to pick his pockets. This performance they repeated on another car, and they were arrested. The men were found guilty and sentenced to imprisonment.

Pulled up the Car within Half Its Length.—At an inquest held in Gateshead, upon the body of a boy who had been knocked down and killed by a tramcar, it was stated by witnesses that the boy ran from behind a trolley right in front of the car, and that the driver pulled up his car within half its length in the effort to save the boy. The coroner remarked that the driver had performed a smart feat in pulling up the car so quickly.

Passenger Gets Damages.—At Lambeth County Court a woman obtained £30 damages and costs against London County Council in an action for personal injuries caused through being thrown off a tramcar. It was contended for the London County Council that the car was full and the chain was up when the woman attempted to board the car, but Judge Parry accepted the plaintiff's statement that the chain was not fastened, and that the car started suddenly, throwing her to the ground, inflicting serious injuries.

Iron and Steel Institute.—The annual meeting will be held at the Institution of Civil Engineers, Great George Street, Westminster, on Thursday and Friday, September 18 and 19. Among the papers to be read will be a report on "Fuel Economy in Steel Works," by Dr. W. A. Bone, Sir Robert Hadfield and Mr. A. Hutchinson; a report on "Fuel Economy in Foundry Practice," by Mr. H. J. Yates; and on "Fuel Economy in German Iron and Steel Works," by Mr. C. Johns and Mr. L. Ennis.

Tramway Connection Between Manchester and Bolton.—Representatives of the Farnworth, Kearsley, and Swinton and Pendlebury District Councils are to meet Mr. Edwardes, general manager of the South Lancashire Tramways Company, to urge the construction of a short length of tramways, 200 or 300 yards, between the Clifton boundary and the Salford Corporation's tramway system, which would effect a through connection of the lines between Manchester and Bolton.

Cinema Films on Fire in a Tramcar.—A Burnley Corporation tramcar was seriously damaged by fire caused by the sudden bursting into flames of cinematograph films which were being conveyed by an employee of the Nelson Electric Palace to the Brierfield Cinema. On boarding the car, the man laid the films on the seat beside him, and from some unknown cause one of the films took fire. The flames were quickly extinguished, but not before two films had been completely destroyed and considerable damage inflicted on the car.

British Prices for Railway Fastenings.—A "Director" of a South American Railway Company in a letter to the *Times* says that they bought railway fastenings at £9 7s. 6d. per ton before the war at prices more or less equal at home and abroad. In 1915, £13 17s. 6d. was paid in England, in 1919 £42 10s. per ton was paid, and this was so far above Continental prices that they had to warn English manufacturers that it might prove impossible to give orders at home in future. A good order has just been placed at under £30 per ton in Belgium, as against £42 to £46 quoted by English manufacturers. The company saves £3,000 and Britain loses £6,000.

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Government Trade Policy.—In the House of Commons on Monday, Mr. Lloyd George is expected to open the box in which Sir Auckland Geddes recently said that the trade policy of the Government was locked up. It it not to be anticipated, however, that the speech will contain any surprising announcement. Our complacent Government will, no doubt, content itself with carrying on the present arrangements for a few months longer. Ministers will probably take the line of least resistance and give a promise of an early reconsideration of the position.

More Publicity Needed at Hull.—A typical example of the bad effect of the failure of tramway authorities to advertise adequately changes in fares and service has just occurred at Hull. A good deal of unpleasantness seems to have been provoked by the introduction of the higher fares, and the local press lays the chief blame on the Tramways Committee for not giving more publicity to the changes made. The only intimation the public received was bills posted inside the cars, and of course passengers are not always inclined to read detailed notices of that kind.

Need of Car Jacks.—At an inquest held in Tynemouth, last week, on the body of a woman killed by being run over by a tramcar, evidence showed that the deceased had deliberately thrown herself in front of the car. It was with difficulty the body was extricated from under the car, and the jury asked why jacks were not carried on the cars. A verdict of "suicide while of unsound mind" was returned, a rider being added to the effect that the tramway company should make provision for such appliances as would be serviceable in cases of similar accident.

Increased Fares at Coventry.—Revised fares and fare stages on Coventry Corporation Tramways came into operation last Monday. The increase in fares amounts to a halfpenny on each ticket, and new penny stages are introduced, approximately three-quarters of a mile in length. The zone or transfer tickets are raised from 1d. to 1½d. Reduced fare return tickets for workpeople are issued up to 8 a.m. only, and those for scholars up to 9 a.m. only. These tickets are likewise increased to three halfpence, and will be available for the return journey.

New London Omnibus.—A new type of omnibus constructed by the London General Omnibus Company was inspected on Monday. It is being severely tested, and in due time will, no doubt, receive the approval of Scotland Yard. The vehicle seats twelve more passengers than the present vehicle, the capacity of which is 34 passengers. In the new omnibus all the seats face forward with the exception of two short seats at the rear. Drawings and other particulars were given in our issue of July 17. Early next year the Omnibus Company hope to complete vehicles of the new type at the rate of 50 a week.

New National Demands.—The Executive of the Municipal Tramways Conference met in London yesterday to consider the latest demands which have been put forward by the National Transport Federation, details of which were given in our issue of August 9. The impression seems to be that unless the demands are granted, tramway labour will be withdrawn. If they are granted, further demands will no doubt shortly be made. Tramway authorities are therefore in a dilemma. There is, however, no justification for making municipal employees a privileged class who receive more than the economic value of their labour.

London M.P.'s and Traffic Report.—London Members, meeting under the chairmanship of Mr. J. D. Gilbert, on Monday, discussed the question of London traffic, and decided to urge the Government to act at once on the recommendations of the Select Committee. The following resolution was passed:—"That this meeting of London Members regrets that no effective steps have as yet been taken to act upon the report of the recent committee on London traffic, and requests the Leader of the House to receive a deputation on the subject forthwith." It will be remembered that Mr. Bonar Law stated in the House a few days ago that the report was receiving the attention of the Government.

Light Railways in Wales.—Proposals have been submitted to Denbigh County Council for the construction of light railways from Denbigh via Llansannan to Llanrwst, from Abergele to Llangerniew, and from Wrexham to Ruthin via Llandegla, and provisionally approved. It was agreed by the Council to consult the Welsh Transport Board on the matter. At the annual meeting of the Welshpool and Llanfair Light Railway Company, Mr. Rees James advocated the extension of the line to Meifod. Mr. R. C. Anwyl, on behalf of the directors, said he recently drew the attention of the Government to the desirability of extending the line to Meifod and also to Llangadfaw in connection with reconstruction schemes.

A Conductor's Eyesight.—At an inquest held at Manchester on the body of a woman who died as a result of a fall from a tramcar, the City Coroner expressed the opinion that ex-soldiers suffering from impaired eyesight should not be employed as conductors. The woman had attempted to board the car while it was moving, and fell back on the roadway, sustaining concussion of the brain. The conductor stated that the car came to a stop at the compulsory stopping place, and seeing no one wishing to board he gave the signal to proceed. When the car had gone a few yards, he saw the deceased trying to get on. A witness gave evidence that the car had begun to move before the passenger attempted to get on, and that neither the driver nor the conductor saw her. The Coroner said that while no blame was attached to the conductor, he felt that, in view of the fact that he had lost an eye through service abroad, he ought to be found other work. On behalf of the Manchester Corporation Tramways Committee, counsel undertook that the Coroner's observations would be conveyed to the proper quarters.

Chesterfield Corporation, as will be seen from an advertisement in another column in this issue, is advertising for a general manager of the electricity, tramways and motor omnibus undertakings. The salary will commence at £600 per annum.

Boys in a Car Shed.—At Aberdeen Children's Court, last week, two boys were charged with having entered a tramway depot on the beach, and damaging a tramcar by driving it against the dead end of the depot shed. The boys had gone into the car shed, and seeing no one about, boarded a car and set it in motion. It ran in the direction of the door, and when they tried to stop it, they only succeeded in making it reverse and start running in the opposite direction. Becoming frightened, the boys jumped off the car, ran out of the shed, leaving the mischief to work itself out. The car collided with another car, breaking the controller and inflicting other serious damage.

More Cars for Dundee.—At the meeting of the Dundee Tramway Committee on Monday last Mr. Fisher, general manager of the Tramways Department, reported on the negotiations for the purchase of the six additional cars for the city—four ordinary cars and two of the Constitution Road type. In both cases, he said, the firm had stated that the cost of materials had gone up. Knowing, however, that the Dundee Corporation were old customers, they had agreed to add the four cars to the ten previously ordered and supply them at the same price. Regarding the two Constitution Road cars, the price was so much above anything expected that nothing had been done. It was agreed that a sub-committee should deal with the matter and report.

Tramway Track and Troubles at Bendigo.—Owing to the dissatisfaction of the citizens of Bendigo, Victoria, with the tramway track and service, a conference was held recently between representatives of the City Council and the Electric Supply Company of Victoria, with a view to discussion of the various questions involved. From the long discussion which took place, it was evident that the tramway track had fallen into a bad condition, chiefly through water troubles. It was eventually agreed that the company should anchor and pack up the rails where it was immediately necessary, and put in drains where the company "admitted" its responsibility. On other matters the conference resolved that the engineers of the company and the council should confer and report to the two bodies with a view of discussing the questions at a subsequent conference.

Maidstone Manager Praises Women Employees.—In his annual report to Maidstone Town Council, Mr. Lambert, the general manager and electrical engineer of the Corporation tramways, refers to the employees in his department in the following terms:—"The women conductors have proved themselves infinitely superior to the youths employed previous to the war and I should be sorry to have to go back to the old conditions. In a town like Maidstone the position does not need a man to collect fares, as it is essentially a woman's job. The whole of the employees have during the year done their duties faithfully and well and there has been no dissatisfaction or discontent so far as I can ascertain. I have pointed out from time to time how essential it is if high wages are to be kept up that each and every one must do his or her best in the interests of the undertaking, and I am pleased to say this has been seriously taken to heart, and it is with pleasure I record my thanks."

PERSONAL.

Mr. William Chamberlain, tramways manager of Oldham Corporation, has been granted an increase in salary from £450 to £700.

Mr. H. F. G. Woods has been appointed borough electrical engineer at Torquay, at a salary of £500 per annum. There were over one hundred applicants for the position.

Mr. Lachlan Mackinnon, traffic superintendent of Glasgow Corporation tramways, has been recommended by the Tramways Committee for appointment as deputy tramway manager at a salary of £1,000 a year.

Mr. J. Dobson, general manager of the Gravesend and Northfleet tramways and the North Kent motor services, has been appointed general manager of Southampton Corporation tramways at a salary of £700 per annum.

Miss J. Buchan, senior clerk to the Dundee, Broughty Ferry, and District Tramways Company for the last 12 years, has been presented with a handsome gold wristlet watch from the tramway staff and a few friends on the occasion of her leaving the Company to go to America.

CONTRACTS AND ORDERS.

Accrington Electricity Committee have recommended the acceptance of the tender of the British Thomson-Houston Company for a turbo-generator and condensing plant at £32,386—turbine and generator at £24,000, condenser £7,800, and air filter £586.

A notable contract recently awarded to the **English Electric Company, Ltd.,** by the Leicester Corporation, includes the supply of a 5,000 kw. 3,000 r.p.m. turbo-alternator set complete with condensing plant and circulating water piping, etc.; also rotary converters, transformers and E.H.T. switchgear, and a complete boiler-house equipment, including, in the initial stages, two marine type Babcock water-tube boilers, each to supply 50,000 lbs. of steam per hour at 200 lbs. pressure, superheated 250 deg. The above plant will be installed at the Aylestone Power Station of the Leicester Corporation, an old boiler-house being dismantled to accommodate the new boilers. The feature of this scheme of extensions is that the plant is so designed as to enable it to be easily transferred to the proposed super power station when necessary.

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FINANCIAL.

Walter Scott, Ltd.—A further dividend of 8¾ per cent., making 12½ per cent. for the year ended June 30, is announced.

North Staffordshire Tramways Co., Ltd.—The dividend for 1918 is at the rate of 5 per cent.

Oldham, Ashton and Hyde Electric Tramway, Ltd.—An interim dividend of 5 per cent. per annum on the ordinary shares has been announced.

Para Electric Railways and Lighting Co.—A dividend has been declared for the half-year at 6 per cent. per annum (3s. per share) on the ordinary shares.

Effect of Strike at Liverpool.—As a result of the strike of employees of the Corporation Tramways, the receipts for the week ended August 9th fell to £6,502. The receipts for the previous week amounted to £23,798, and for the corresponding week a year ago £22,418.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Aug. 13 amounted to £80,969, an increase of £11,644 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to Aug. 13 (nineteen weeks and two days) the total receipts were £1,573,805, an increase of £343,829 on the corresponding period of 1918.

West Ham Corporation Tramways.—In the year ended March 31 last the expenditure, including war allowances of £15,433, was £199,576, an increase of £30,750. The income, after deducting sums due to other authorities for through running, was £287,487, an increase of £48,636. There is a gross profit of £22,469. If war allowances were excluded, the gross profit would have been £37,911. After repayment of mortgage loans, contribution to sinking fund and interest, there is a deficit of £7,703. [illegible]

Brighton Corporation Tramways.—In his report for the year ended March 31, 1919, the engineer and general manager (Mr. William Marsh) states that all previous records were again beaten in the revenue and number of passengers carried. The growth of the undertaking in recent years is shown in the comparative statement of results given in the table below. Although the revenue increased by 7.78 per cent., the working expenses increased in a far greater proportion, the addition being as much as 26.25 per cent. The net balance (£5,092) was consequently much smaller than in the preceding year. The increase in working expenses is, of course, due to the cost of labour, materials and electricity. Not only has the total amount of the weekly wages sheet been more than doubled during the last three or four years, but the average rate per hour has more than doubled. In 1914 the weekly wages were £414, the average earnings per employee, 27s. 5d., and the average wage per hour 6.53d. In 1919 the weekly wages were £829, the average earnings per employee, £2 16s. 9d., and the average earnings per hour 13.19d. In the current year Mr. Marsh says there is every probability that wages alone will amount to £50,000, or more than the entire revenue of the undertaking a few years ago. Owing to the coal shortage the mileage was cut down by nearly 20 per cent., but there was an increase in passengers of nearly a million and a half. For a period of practically eleven and a half years there has been scarcely any change in fares, but in consequence of the increased working expenses a revised scale was adopted on March 31, 1918. The average fare received has been 1.1d. per passenger, but this figure has been increased to 1.3d.

Year ended March 31.	1919.	1918.	1917.	1916.
	£	£	£	£
Traffic revenue	84,414	77,916	62,527	55,871
Miscellaneous revenue	2,574	2,306	2,292	2,065
Total revenue	86,988	80,222	64,819	57,936
Working expenses	65,646	48,398	41 498	41,001
Surplus on working	21,342	31,824	23,321	16,935
Bank interest	570	391	134	38
Total gross profit	21,912	32,215	23,455	16,973
Interest on capital	7,232	7,301	7,345	7,348
Sinking fund	5,790	6,195	6,432	6,429
Income tax	3,798	2,041	1,644	965
Revenue contribution to capital outlay	—	1,250	513	—
Net balance	5,092	15,428	7,521	2,231
	21,912	32,215	23,455	16,973
Car-miles run	951,072	1,152,006	1,131,201	1,053,285
Passengers carried	18,498,267	16,942,512	13,678,251	12,295,198
Number of units used	1,670,949	1,907,537	1,837,629	1,678,627
Units per car-mile	1.76	1.65	1.62	1.59
Average traffic revenue per car-mile	21.302d.	16.23d.	13.26d.	12.73d.
Average traffic revenue per mile of single track	£4,910	£4,532	£3,637	£3,191
Average total revenue per car-mile	21.95d.	16.71d.	13.75d.	13.202d.
Percentage of working expenses to receipts	72.89	57.25	58.56	64.14
Average working expenses per car-mile (excluding power)	13.01d.	7.17d.	5.78d.	6.35d.
Average working expenses per car-mile (including power)	16.00d.	9.56d.	8.05d.	8.47d.
Average car miles per day per car	79.25	83.92	88.56	77.76
Average journeys per head of population per annum	138.11	126.5	102.13	91.8

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919	Incr. or Dec.
Aberdare U.D.C.	Aug. 5	636	664	+ 28	18	9,822	+ 559
Aberdeen Corporation	,, 6	2,899	3,746	+ 847	9½	33,59[illegible]	- 7,233
Ayr Corporation	,, 9	943	1,051	+ 108	12	11,201	- 1,645
Belfast City	,, 1	8,403	10,374	+ 1 971	18	184,132	+ 46,234
Birkenhead Corporation	,, 10	2,620	3,185	+ 565	19½	62,486	+ 10,305
Birmingham Corporation	,, 2	24,016	24,966	+ 950	18	460,669	+ 44,604
do. Motor Buses	,, 2	1,586	1,721	+ 135	18	31,166	+ 4,011
Blackburn Corporation	,, 6	2,245	2,132	— 113	19½	45,860	+ 1,001
Bradford Corporation	,, 2	10,218	12,268	+ 2,050	19	204,635	+ 45,613
Burnley Corporation	,, 9	2,597	3,313	+ 716	..	..	..
Burton-on-Trent Co.	,, 10	550	613	+ 63	19	9,381	+ 1,571
Bury Corporation	,, 10	2,281	2,560	+ 179	18½	46,205	+ 6,852
Chatham & District	July 31	1,428	1,791	+ 363	30	44,425	+ 6,059
Cork Electric	,, 31	672	816	+ 144	30	19,327	+ 280
Derby Corporation	Aug. 9	1,864	2,206	+ 342	19	36,266	+ 7,397
Dundee City	,, 6	1,917	2,515	+ 598	11½	30,635	+ 7,354
East Ham Corporation	,, 9	1,867	2,155	+ 288	18½	36,368	+ 8,318
Glasgow Corporation	,, 9	28,633	33,338	+ 4,705	10	317,484	+ 32,848
Glossop (U.E. Sup. Co.)	,, 9	218	235	+ 17	32	7,076	+ 1,233
Halifax Corporation	July 31	2,553	3,513	+ 960	15½	55,134	+ 13,591
do. Motor Buses	,, 15	60	81	+ 21	15½	1,249	+ 325
Huddersfield Corporation	Aug. 9	4,924	5,278	+ 354	19	93,135	+ 21,597
Ilford U.D. Council	,, 9	1,310	1,443	+ 133	18½	22,956	+ 3,912
Ipswich Corporation	,, 9	1,232	1,387	+ 155	19	17,781	- 3,082
Isle of Thanet	,, 6	933	2,814	+ 1,881	44½	31,990	+ 21,231
Kilmarnock Corporation	,, 9	243	243	Nil	12½	3,689	+ 546
Lanarkshire	July 31	3,281	3,741	+ 460	30	105,292	— 1,900
Leeds City	Aug. 9	16,268	17,777	+ 1,509	19	318,554	+ 75,182
Leicester Corporation	,, 9	5,393	6,297	+ 904	..	..	..
Leyton U.D Council	,, 7	2,855	3,666	+ 811	19	60,410	+ 18,105
Liverpool Corporation	,, 9	22,418	6,502	—15,916	31½	678,518	+ 115,421
London County Council	,, 13	69,325	80,969	+ 11,644	19½	1,573,805	+ 343,829
Maidstone Corporation	,, 7	394	527	+ 133	18½	7,280	+ 1,899
Manchester Corporation	,, 9	27,980	30,315	+ 2,335	19	577,742	+ 100,451
Newcastle-on-Tyne Cor.	,, 9	9,927	9,354	— 573	19	182,046	+ 11,872
Northampton Cor.	July 27	847	1,206	+ 359	16	21,546	+ 6,904
Nottingham Corporation	Aug. 7	7,419	7,907	+ 488	19	133,672	+ 22,915
Oldham Corporation	,, 10	3,971	4,808	+ 837	20	68,298	+ 18,223
Reading Corporation	,, 7	1,695	1,893	+ 198	18½	30,010	+ 5,676
Rotherham Corporation	,, 11	2,755	2,044	— 712	19½	42,905	— 488
Sheffield Corporation	,, 10	13,884	18,507	+ 4,623	19½	334,961	+ 69,349
Southampton Cor.	,, 6	2,958	3,367	+ 409	18½	51,517	+ 4,189
Southend-on-Sea Cor.	July 28	1,492	3,057	+ 1 565	17	33,749	+ 15,973
South Shields Cor.	Aug. 2	1,282	1,497	+ 214	18	24,834	+ 4,815
Sunderland Corporation	Aug. 10	2,453	3,616	+ 1,163	19	55,688	+ 15,405
Torquay Tramways	July 31	1,274	1,537	+ 263	30	30,255	+ 5,290
Tyneside Trys. & Trmrds.	July 16	1,199	1,269	+ 70	3	2,445	— 209
Wallasey Corporation	Aug. 9	3,008	3,044	+ 36	18½	48,775	+ 12,781
Walsall Corporation	,, 9	1,708	1,644	— 64	19	26,569	+ 3,124
Walthamstow U.D. Coun.	,, 9	1,914	2,184	+ 270	19	34,048	+ 5,824
Warrington Corporation	,, 7	835	955	+ 120	18	16,804	+ 2,574
West Ham Corporation	,, 7	5,420	5,752	+ 332	18½	101,831	+ 19,658
Wolverhampton	,, 13	1,903	2 072	+ 1,169	19	39,074	+ 5,017

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Aug. 6	£55,498	£64,845	31	£1,722,295	+ £10,476
Ballarat and Bendigo (4 wks)	May 25	3,256	3,286	8	7,557	+ 176
Brazilian Traction (Mlrs.)	June	9,087,000	9,369,000	26	53,963,000	+ 4,270,000
Brisbane	July	36,360	41,610	30	262,155	+ 14,371
British Columbia $	June	488,873	411,605	52	7,062,599	+ 1,076,122
Buenos Aires Lacroze	July	41,145	45,222	4	45,222	+ 4,077
Burmah Tram. & Light Rs.	June 30	31,158	41,518	48	406,403	+ 106,471
Calcutta Rs.	Aug. 2	78,852	87,955	30½	..	+ 354,800
Carthagena and Herrerias	July	5,491	4,183	30	20,974	— 12,149
Cordoba	Feb.	12,972	13,549	48	159,208	+ 11,492
East India	July	1,968	2,687	52	24,689	+ 6,760
Hong Kong $	June 21	12,693	15,360	25	257,603	+ 25,495
Kalgoorlie	March	2,700	2,653	13	7,493	— 102
La Plata	July	6,721	5,317	31	32,774	+ 2,840
Lima	May	42,949	42,965	22	110,666	+ 8,925
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	June 30	40,270	44,349	26	453,043	— 30,367
Manila $	May	175,500	183,050	21	1,046,433	+ 199,183
Montevideo	July	31,684	34,189	39	334,076	+ 32,551
Para	June	25,445	24,647	30	172,077	+ 2,541
Pernambuco	Aug. 10	4,062	5,546	31½	167,560	+ 25,064
Peruvian $	July	987,300	1,058,780	..	..	..
Rangoon	July	6,054	6,062	30	45,188	+ 1,435
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 52,577
Singapore $	June 21	12,690	15,528	25	385,872	+ 47,672
Toronto $	June	1,035,932	842,697	26	6,132,296	— 222,873
Winnipeg $	June	293,140	112.615	26	1,874,640	+ 63,302

CARS, MOTORS, CONTROLLERS.
(DICK, KERR SYSTEM.)
THE
ENGLISH ELECTRIC COMPANY LIMITED,
Queen's House, Kingsway,
LONDON, W.C.2.

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THE
Tramway AND Railway World

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SATURDAY, AUGUST 23, 1919.

DISABLED MEN AS EMPLOYEES.

If the opinion of the Manchester coroner that conductors ought to possess full vision is endorsed by provincial licensing authorities, the latter will be more stringent in their requirements than the public carriage branch of New Scotland Yard. The coroner's view was expressed in connection with the death of a passenger from injuries sustained when boarding a moving car, unseen by both the conductor and driver: and although the coroner held that no blame was attached to the conductor, he expressed the opinion that as the man had lost the sight of one eye in the war, he ought to be found other work. So sweeping a ban is not likely to meet with general approval. It is as embracing as the recommendation arrived at in July, 1916, by the Committee appointed by the Home Office to consider what action should be taken in the Metropolitan district in the case of drivers who have sustained partial disablement in the war. That Committee recommended that licenses to drive should not be granted to men who had sustained the loss of an arm, hand, leg, foot, or eye, but "in the case of injury to one eye, provided the other eye is sound and the injured eye retains fair vision, the Committee consider that "a license might be granted; each case being decided on its merits." It will be generally conceded that a conductor's duty does not call for the use of such full powers of sight as in the case of a driver. Nevertheless, the responsibility of deciding upon his fitness for employment ought to be relegated to the medical officer, whose inclusion in a public carriage staff has become, in consequence of the war, imperatively necessary. It may be useful to recall that in December last the Home Secretary re-appointed, with the addition of Messrs. A. L. C. Fell and H. E. Blain, the Committee who had considered the course of action to be taken in regard to disabled drivers. Their task is to review the conclusions previously arrived at, and to report whether the recommendations should now be reaffirmed or modified. Meanwhile, New Scotland Yard is acting upon the previous report, and in the case of a taxi-driver who has lost an eye, they have, it is stated, decided that he must await the report of the new Committee, although he continued to drive an army lorry for many months after the loss of his eye. Without a knowledge of the exact conditions under which the applicant remained at work as a lorry driver, it would be difficult to institute a comparison with the requirements entailed by driving a cab in the Metropolis, but the applicant asserts that he could easily pass the usual tests. Doubtless this case has been brought to the notice of the Committee by the police authority in the additional evidence that would be forthcoming as the result of a large number of drivers having been demobilised since the new Committee were appointed. In view of the conditions peculiar to London traffic, it will not be surprising if the recommendations made in 1916 are again put forward. For rejected men who have suffered in the service of the country there are now numerous and extensive facilities of training in other occupations.

LONDON COUNTY COUNCIL CAR OVERTURNS.

OPENING OF THE INQUEST.

On Saturday afternoon, August 16, an L. C. C. tramway car, which was proceeding from Hampstead to Holborn well filled with passengers, on rounding the bend in the road from Great College Street to Pancras Road, left the rails, mounted the kerb and dashed into the railing of the gardens of Goldington Crescent. The car then toppled over, pinning under it three people, one of whom was killed outright, and another has since died as a result of his injuries. Seventeen other passengers were injured. The top part of the car was thrown over the railings. In falling the front of the car struck and overturned two section feeder boxes, the wires in which fused. Tramway men and policemen managed to raise the wreckage sufficiently to release the people pinned underneath. The car had come down Great College Street at a moderate rate, but left the track on the curve, the wheel-marks on the paving of the road clearly showing its course to the kerb.

An inquest into the death of the two men was opened at St. Pancras Coroner's Court by Mr. Walter Schroeder, on August 20. At the outset Mr. W. J. Squires, chairman of the London County Council Highways Committee, expressed his own deep sympathy and also that of the London County Council with the relatives and friends. Mr. James, a compositor, who gave evidence, said he was rendered unconscious for several minutes by the accident, and was then able to get out of the car without help. There was nothing unusual in the speed of the car. There was no swaying or any other motion out of the ordinary. John Pearce, another passenger who was travelling inside the front of the car just behind the driver, said he was aware of the compulsory stop at Goldington Crescent. The driver did his best to pull up there, using both brakes; he also shouted to give warning to everyone. In reply to a question of the coroner, he reiterated that the driver stuck to his brakes all the time. The driver of a tramway car approaching in the opposite direction said he saw the driver pulling hard at his brakes. Four miles an hour was a safe speed to take the corner, but the car was going at least two or three times as fast as that. The inquest was adjourned until August 28.

LONDON TRAFFIC.

To the Editor of the "TRAMWAY AND RAILWAY WORLD."

SIR,—I see from the newspaper reports that on Thursday last, the 14th instant, Lieut.-Col. Malone, M.P., asked the Prime Minister in the House of Commons whether the Government had considered the report of the Select Committee on Metropolitan Passenger Transport; whether it is proposed to carry out the recommendations of that report; and, if so, when?

Mr. Bonar Law made the following amazing reply:—"This report, which requires very careful study, is at present under the consideration of the Departments concerned."

Surely it is the very height of absurdity that these Departments, which it is suggested in the report should be superseded, and one of which is described as being "archaic, unbusinesslike, and utterly subversive of progress," should be consulted in the matter at all. Are we again going to have this matter shelved, as it was in 1905?

I would suggest that during September, or early in October, some member of the L.C.C.—say the Chairman of the Highways Committee—should convene a meeting of representatives of all the Municipal Tramway-owning Authorities in Greater London, and the Parliamentary Representatives of each of the districts concerned (and possibly the members of the Select Committee also), in order to consider this matter, and arrange for taking united and determined action to compel the Government (if necessary) to embody the recommendations of the Select Committee in a legislative enactment. The matter is of vital importance and should not be allowed to fizzle out, which, in view of the present action (or inaction) of the Government seems a possibility.

Tramway Offices,
Walthamstow, E.,
19th August, 1919.

Yours faithfully,
WM. MURRAY,
Tramways Manager.

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TEMPORARY SETTLEMENT AT SHEFFIELD.

Sheffield tramway men, having received some concessions from the Tramways Committee, have decided not to declare a strike for the time being. After a meeting on August 15, at which the general secretary and a member of the National Executive of the Amalgamated Association of Tramway and Vehicle Workers addressed the men, the following statement was issued for publication :—

"That this meeting considers in regard to the acute position which was caused by the Sheffield Corporation Tramways Committee refusing the application of 2s. per hour for first-class motormen, other grades in proportion ; time and a half to all men on Sunday duty ; time and one-fifth for night workers ; and 3s. 6d. per week increase to the shed workers in accordance with engineers' award, that the position is eased somewhat by the fact that the Tramways Committee have now conceded the last two items and have reduced the working time on Sunday rates to a period of one year instead of two years.

"The majority for strike action to compel these demands was so great that the members could not accept the concessions made as a settlement of the dispute, and the secretary was instructed that the tramways manager and the Committee be informed that, unless they are prepared to rectify the anomaly of the differing rates for Sunday labour, permission be sought from the Executive Council to withdraw labour at once.

"In regard to the application for increase of wages it was decided that this matter be held over temporarily until the present national application is decided."

STANDING PASSENGERS IN LONDON.

Mr. Gilbert asked the Home Secretary on August 19th whether he could state for how long a period it was proposed to continue the permission granted by the Metropolitan Police to tramway and motor omnibus undertakings to carry over the number of licensed passengers on tramcars and omnibuses plying in the Metropolitan area ?

Mr. Shortt replied that it was not possible at present to say for how long a period this permission would be continued. It would necessarily depend on the number of vehicles available. Up to the present the output of new vehicles had been small, but a new type of omnibus had been approved, and it was anticipated that a start will be made to turn out a number of new vehicles in the near future.

MISCELLANEOUS NEWS AND NOTES.

Three Weeks' Stoppage at Doncaster.—After a suspension of three weeks, owing to the Yorkshire coal strike, service on the Doncaster Corporation tramways was resumed on August 15.

Gas for Motors Unrestricted.—The Board of Trade give notice that the Gas (Use in Motor Vehicles) Local Prohibition Order, 1918, ceased to have effect as from Monday, August 18.

Ex-Soldier Employees at Burnley.—Burnley Tramways Committee have asked the Town Council to allow them to employ disabled sailors and soldiers to the extent of 5 per cent. of the adult male staff.

Fine for Car Obstruction at Norwich.—At Norwich Police Court the full penalty of £5 was imposed upon a cab proprietor and driver who wilfully drove his cab at an unreasonably slow pace on the tramway track, thus obstructing the cars.

Increase of Fares at Dudley.—The minimum fare has been increased to 1½d. Similar action has been taken by several adjacent tramways, including Wolverhampton and Walsall tramways.

Upper Deck Passenger Injured.—While a motor omnibus from Shoreditch to Croydon was passing through Lewisham High Street, on August 16, a passenger on the upper deck fell unconscious, having received a severe injury to his head. It is reported that he was struck by a passing tramcar.

Rear Lights on Vehicles.—The London Safety First Council has entered a firm protest against the withdrawal of the regulation covering the provision of a red rear light on vehicles and cycles. In the opinion of the Council, the regulation now withdrawn contributed to the safety of the public.

Government Motor Cars.—Mr. Bonar Law has stated that Ministers have decided to give up the motor cars hitherto allotted to them, and hereafter no cars will be allotted personally to anyone. A certain number of cars required for Government service will be maintained, but the number has already been much reduced.

Car Building Resumed at Glasgow.—The work of car building has been resumed at the Glasgow Corporation Car shops at Coplawhill. During the war these were devoted to the production of munitions. New cars are now being turned out as rapidly as circumstances permit, as additional cars are urgently needed to cope with the increasing traffic.

The Dunlop Rubber Company is introducing a new style of motor tyre, which will be known as the Dunlop Type Magnum. The tyre has a moulded non-skid tread of very rough rubber, which it is claimed will enable it to retain the pattern for a much longer period than the ordinary non-skid type. The Dunlop Magnum tyre is made only in standard sizes, and will be manufactured in the company's new works now being erected at Fort Dunlop. No orders can be accepted for the Dunlop Magnums at present, but the company will at the earliest moment announce the sizes first available.

The Ministry of Transport Act.—The Transport Bill received the Royal Assent on Friday afternoon, August 15th. The appointment of the Right Hon. Sir Eric Campbell Geddes as Minister of Transport was subsequently announced. The heads of departments under the new Ministry were selected some time ago, and their names were given in our issue of July 19th.

Inspector Fatally Injured at Bristol.—At an inquest held in Bristol into the death of William Bell, a tramways inspector, who was fatally injured in stepping from an omnibus, it was stated that the deceased had been in the employ of the Bristol Tramways and Carriage Company for twenty-one years, and had had an excellent record.

Fifty Years of Tramways at Liverpool.—On July 27 occurred the fiftieth anniversary of the beginning of work on the construction of the first tramway in Liverpool. This line ran from the Town Hall to the Dingle, and was open for traffic a few months later, ten cars being put in service. The fare was 3d. inside for any distance, and 2d. outside. The cars were popular from the outset.

Long Service Conductors.—A conductor in the employ of the Liverpool Corporation Tramways has seen twenty-seven years' service. He was originally employed by the old Liverpool Tramways Company, and was transferred to the Corporation when the tramways were taken over. There are said, however, to be men whose period of service has been even longer than this.

Light Railway for South Shields.—South Shields Town Council have decided to make an application to the Light Railway Commissioners for an order for the construction of a light railway between South Shields and Cleadon. The Corporation recently purchased Cleadon Park, which is about three miles from the town, and they desire to make it more accessible, as a housing scheme will be carried out there.

Motor Omnibuses for Stirling.—The directors of the Stirling and Bridge of Allan Tramways Company have been considering the question of mechanical traction. The original idea was to electrify the lines, but in the present abnormal conditions they have abandoned the idea of applying for Parliamentary powers, and they have placed an order for a number of motor omnibuses, which will be put on certain routes with a view to developing their business.

Aberdeen Tramway Service Men Returning.—Of 171 original employees of Aberdeen Corporation Tramways who enlisted with the colours, 18 were killed, 124 have been demobilised and reinstated, and 29 are still in service. Temporary employees, including women, are being dispensed with as the soldiers return. During the present year the number of women employed has decreased by 63. On June 1 the staff comprised 425, and at present there are over 450 employees.

Passenger Fined for Obstruction.—At Glasgow a man who was charged under a tramway by-law with having obstructed a woman conductor in the discharge of her duties by refusing to leave a car which had its full complement of passengers, was fined 31s. 6d. It was stated that the defendant was asked to leave the car, but he refused, contending that he was as much entitled to stand as were other passengers. The car was delayed about eight minutes by his refusal.

Elocutionary Tests for Conductors.—In the course of an inquest at Hobart (Tasmania) city police court recently, it was stated that the conductors were required by the regulations to call out the names of the streets as the car approached them. The coroner asked whether conductors were put through an elocutionary test, and added that it was not much use calling out the names of the streets if the passengers could not tell what the conductors said. He had frequently been on cars when it was impossible to distinguish anything but "street."

Review of the Foreign Press Discontinued.—It was recently announced that the Review of the Foreign Press, including the Technical Supplement, was to be discontinued from motives of economy. Lieut.-Col. Malone later asked the Secretary of State for War whether he would consider the publication of a brief summary of the five sections of the Review, so as to enable members to digest important items without spending the amount of time required for their complete perusal. In reply, Mr. Forster said that in view of the urgent need for economy, he could not undertake to adopt the suggestion.

2d. Per Omnibus Mile.—On condition of the payment of 2d. per omnibus mile, Oxfordshire County Council has sanctioned the institution of four new omnibus routes. Lancashire County Council, in consenting to several omnibus services, has stipulated that the vehicles shall run along routes defined on a plan to be supplied by the county surveyor, and that 2d. per vehicle mile shall be paid to the Council, together with an initial fee of one guinea per annum; that a journey book be kept by the applicants in which the journeys made each day are to be recorded, with the number of passengers, such book to be open to the inspection of the county surveyor or his agent.

London Traffic Report.—Before the House adjourned, Mr. Bonar Law again stated that the Government had not yet come to any decision as to the action to be taken on the report of the Select Committee on London Traffic. They hoped, however, to carry out some of the recommendations. In reply to a question by Mr. Kennedy Jones, who asked if Mr. Bonar Law was aware that it was specifically laid down in the report that the congestion in the coming winter was likely to be much greater than at present, and if he did not think it advisable to deal with the congestion as rapidly as possible, Mr. Law said that he agreed with the suggestion. It is understood that the report has been referred to the officials of the Board of Trade

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Useful Waste Tickets.—The Glasgow tramways department in the interests of economy and street tidiness have drawn the attention of passengers leaving the cars to the boxes provided for used tickets. Only a portion of the passengers make use of the receptacles, and at busy stopping places the roadways are littered with tickets: but over two tons of used tickets are collected weekly from the receptacles and sold at a good price as waste paper.

Alcohol Fuel Tests.—*Nature* states that the Inter-Departmental Committee on Power Alcohol has arranged with the London General Omnibus Company to run a number of motor omnibuses for six months on alcohol-benzol and alcohol-benzol-petrol mixtures, so that results may be obtained to compare with the running on petrol and other fuel. By the end of the year the Committee hope to be able to publish information that will enable the Government to take definite steps to render alcohol available for all motor users.

London-Paris Air Service.—On Monday the first regular international daily air service in the world will begin between London and Paris. Machines start on this side from Hounslow and from Le Bourget, half-an-hour's drive from the centre of Paris, at 12.30 p.m. each day. It is expected that the journey will be made at an average speed of 100 miles an hour in ordinary weather, so that the journey should be completed in two hours and a quarter. Once a week a large machine carrying fourteen passengers will make the journey.

Tramway Employees' Demands.—Negotiations are continuing between the representatives of the National Transport Federation and the Municipal Tramways Association and the Tramways and Light Railways Association concerning the demand for an increase in wages, and for the war bonuses to be merged into wages. The principal demand is for an increase of 12s. a week for employees over 18, and 6s. a week for those under 18. These concessions it is economically impossible for the employers to meet, and it remains to be seen whether the employees will press their demand to a deadlock.

Trucks for Bombay Tramways.—The Bombay correspondent of the "Daily Telegraph," telegraphing on August 15th, says that three years ago the Bombay Electric Tramways Company ordered 78 tramway car trucks in England, and only recently secured shipment of 64 of them. Meanwhile they purchased in America 50 trucks, which have been delivered. The company, who urgently need more cars to replace the wastage during the war, and to cope with traffic expansion, have now purchased 130 additional trucks in America, the order going there instead of to England, owing to a wide difference in prices.

Government and Standardisation.—To a summary of his speech in the House of Commons on Monday, Mr. Lloyd George has added one or two new proposals. With regard to standardisation, he says, there is growing recognition of the importance for the future of British industry in the principle and practice of standardisation, but so far the State has done little. It is proposed to set up at the Board of Trade a Department of Standards (1) to promote and co-ordinate standardisation generally; and (2) to establish and administer such testing institutions as may be found necessary, and authorise and, so far as may be required, supervise the testing work carried out by technical institutions, trade organisations, or private concerns.

Lanarkshire Tramways.—At a recent joint meeting of representatives of the Lanarkshire County and Borough Authorities, Sir Thomas Munro, county clerk, stated that the option of purchase conferred upon the County Council by an agreement annexed to the Lanarkshire County Tramways Act, 1912, would expire within the next few months. Unless within that period the local authorities by joint action agreed to acquire the whole of the tramway undertaking, the Bellshill lines, which were constructed at the cost of the County Council and were at present worked by the Lanarkshire Tramways Company on lease, would fall to be transferred to the company. There would be no other opportunity of compulsory purchase before 1928. In 1928 the system could be acquired at fair market value, and in 1938 at scrap iron value. The authorities should therefore consider jointly whether any steps should be taken to acquire the tramways. Sir Thomas Munro has communicated with the tramway company, asking them to state what price they would be prepared to accept for the undertaking.

CONTRACTS AND ORDERS.

Ferguson, Pailin & Co. are supplying extra high tension switchgear to Sunderland Corporation.

Electric Vehicles for Preston.—Preston Town Council have secured permission for a loan of £2,057 for the purchase of two electric vehicles.

Rotherham Corporation Tramways Committee has recommended the purchase of four chassis at £990 each from the Associated Equipment Company, of Walthamstow, and four omnibus bodies at £500 each from Messrs. James Bartle and Company, of London.

Belfast Tramways Committee have decided to recommend the Council to accept the tender of the Brush Electrical Engineering Company for 50 car bodies and trucks. The general manager, Mr. J. S. D. Moffet, has been instructed to make further inquiries in regard to the equipment of the cars from the firms tendering.

Sheffield's New Motors.—Sheffield Corporation Cleansing Committee have decided to purchase three Edison electric vehicles at £1,304 each; an electric vehicle at £1,200 from Messrs. R. Garrett & Sons, Ltd.; a 3½ ton electric vehicle for £1,340 from the General Vehicle Co., Ltd.; and a four-wheeled drive petrol wagon for £1,100 from Messrs. A. T. Bennett & Co.

PERSONAL.

Salary Increases at Sheffield.—Sheffield City Council has accepted the recommendation of the Finance Committee granting increases in salaries to a number of officials of various departments, including **Mr. A. R. Fearnley,** general manager of the Corporation tramways and motor department, from £1,000 to £1,500 a year by annual increases of £100.

Mr. H. P. Stokes, electrical engineer and manager of Bexley Council tramways, has been appointed engineer and manager of Doncaster tramways, at a salary of £700 per annum.

Mr. C. H. Merz has arrived at Cape Town to investigate the proposed electrification of certain sections of the South African Railways and to advise the Union Government regarding the production of electric power

Doncaster Tramways Committee have accepted with regret the resignation of **Mr. E. S. Rayner,** borough electrical engineer and tramways manager, who has recently been appointed manager and engineer of the Hull Corporation tramways.

Mr. H. S. Ellis, on his departure to take up the position of borough electrical engineer at Southampton, was presented by the South Shields electricity staff and employees with a travelling case and slide rule, and Mrs. Ellis was presented with an oxidised silver table lamp.

Mr. H. G. Burgess has been appointed the chief representative of the Ministry of Transport in Ireland. He has been in the service of the London and North Western Railway Company for forty years, and has been the company's general manager in Ireland, responsible for all its shipping and railways, for the past twenty years. During the war he was Director of Irish Transportation and the Coal Controller's representative in Ireland.

FINANCIAL.

Walter Scott, Ltd.—For the year ended June 30th last the profits, after providing for estimated liability for excess profits duty, amounted to £119,466.; £16,889 was brought forward, making a total of £136,355. A dividend of 3¾ per cent. on the ordinary shares, making 12½ per cent. for the year, is recommended.

Treasury Restrictions Withdrawn.—On Tuesday night the Treasury announced the removal of restrictions imposed during the war on the export of capital. Remittances can now be made abroad for the purchase of any form of property, and securities held abroad can now be sold at the Stock Exchange, provided they have not been in enemy ownership since the outbreak of war.

York Corporation Motor Buses.—The accounts of the York Corporation for the year ending March 31st last show for the motor bus service an income of £3,135 9s. 9d. and an expense of £3,772 1s. 3d. The loss was thus £636 11s. 6d. Of £7,500 capital, £4,750 has been repaid. The working expenses per car mile were 11.26d. compared with only 8.17d. the year before.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Aug. 20 amounted to £79,198, an increase of £3,882 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to Aug. 20 (twenty weeks and two days) the total receipts were £1,653,068, an increase of £347,777 in the corresponding period of 1918.

Sunderland Corporation Tramways.—The annual report for the year ended March 31, 1919, shows that the total revenue was £119,691, and working expenses amounted to £67,321. After deducting interest on capital, sinking fund, income tax, and other charges the sum of £9,805 was placed to reserve and renewals fund, and £5,000 was paid to the Borough Fund. The passengers carried numbered 26,251,700. The total working expenses per car mile were 12.2d. and the traffic revenue per car mile, 21.4d. Power consumption averaged 1.39 units per car mile.

Dundee City Tramways.—The estimates of income and expenditure for the twelve months ending May next include a heavy increase in working expenses. The total working expenses for last year were £76,225, and the estimated total for expenditure next year is £100,338, an increase of £24,113. The estimated income for the current year is £130,820. Last year the income was £105,953. At a Town Council meeting the convener of the Tramways Committee, Mr. G. A. Johnston, said they proposed to spend £10,000 on the permanent way, which had been much neglected during the war. The town clerk reported that he was getting particulars from various Corporations where they had power to devote the profits from the tramways to the assistance of the rates. In Dundee at present they had no power of this kind.

Glasgow Corporation Tramways.—The annual report of the Glasgow Corporation Tramways for the year ended May 31, 1919, has recently been issued (50 pages, 13 in. by 8 in.). A summary of the results was published in our issue of July 17. As there stated, the total revenue amounted to £1,531,319 and the total expenditure to £1,249,988. After allowing for rent of Paisley lines, income tax, renewals and depreciation, there was a balance of £14,773, which was paid over to the common good. The total amount of expenditure on capital account at May 31, 1919, was £3,880,299. The balance standing at the credit of the depreciation and permanent way renewal fund was £449,005. The rates of depreciation and permanent way renewal are now as follows:—Permanent way, £700 per mile of single track; power station and substations plant, 3 per cent.; cars, 5 per cent.; electric equipment of cars, 5 per cent.; other rolling stock, 15 per cent.; and Clydebank bridges, 5 per cent.

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TENDERS INVITED.

PORTSMOUTH CORPORATION TRAMWAYS COMMITTEE.

The Tramways Committee of the above Corporation invite Tenders for the supply of the undermentioned goods from October 1st, 1919, to September 30th, 1920 :—

SECTION A.—Ballast, Sand and Grit.
SECTION B.—Portland Cement (British manufacture preferred).
SECTION C.—Brooms and Brushes.
SECTION D.—Oils (not lubricating), Chemicals, Sheet Glass, etc.
SECTION E.—Smith's Coal and Coke.
SECTION F.—Timber.
SECTION H.—Brake Blocks.
SECTION I.—Engine Packings, Asbestos Goods, etc.
SECTION J.—General Ironmongery.
SECTION O.—Wood Paving Blocks.
SECTION P.—Car Repair Stores.
SECTION Q.—Insulating Materials, Lamps and Motor Windings.
SECTION R.—Overhead Line Materials.
SECTION S.—Lubricating Oils, Greases, etc.
SECTION T.—Chandlery, etc.
SECTION U.—Castings and Machined Parts.

The Specification and Form of Tender may be obtained upon application to the Engineer, Mr. V. G. Lironi, M.I.M.E., A.M.I.E.E., Engineer's Office, Vivash Road, Fratton, Portsmouth.

Tenders, marked "Tender for——" to be delivered to the Town Clerk, Town Hall, Portsmouth, not later than 10 a.m. on Tuesday, September 2nd, 1919.

The Form of Tender must include a declaration that the person making the Tender pays the rates of wages and observes the hours of labour and conditions contained in the Corporation Fair Wages Clause.

The Committee do not bind themselves to accept the lowest or any Tender.

W. R. SPAVEN,
General Manager.

Town Hall, Portsmouth,
August 8, 1919.

COUNTY BOROUGH OF SALFORD.

Salford Tramways.

Tenders invited by September 1st, 1919, for 6 Covered Tops and Vestibule Ends for Bogie Cars. Further particulars from General Manager, 32, Blackfriars Street, Salford.

L. C. EVANS, Town Clerk.

POSITIONS VACANT.

BOROUGH OF DOVER.

Tramways Department.

Wanted, Car Depot Superintendent, practical, experienced, for maintenance of electric cars and equipments, good knowledge of overhead line renewals and repairs and control of men, £225-£250 per annum.

Apply not later than September 1st, 1919, in writing, stating age, qualifications, and experience, with copies of not more than three recent testimonials, to

ERNEST H. BOND,
General Manager,
Corporation Tramways, Dover.

COUNTY BOROUGH OF TYNEMOUTH.

The Tynemouth Corporation invite applications for the appointment of Installation Engineer.

The person appointed must have a good knowledge of electricity for lighting, power, etc., and must undertake publicity work and the canvassing of consumers, under the direction of the Borough Electrical Engineer. The salary is £3 10s. per week, plus commission.

Applications, stating age, present occupation and previous experience, together with copies of three recent testimonials, should be forwarded to the undersigned not later that SEPTEMBER 1st, 1919, endorsed on the envelope "Installation Engineer."

C. TURNBULL, M.I.E.E.,
Borough Electrical Engineer.

Electricity Works,
Tynemouth

Draughtsman for Tramway Engineering Work, required for design of fittings for tramways and overhead power lines.—Apply, stating age, salary, and experience, to Box No. 66, THE TRAMWAY AND RAILWAY WORLD, Amberley House, London, W.C.2.

For Immediate Sale.—Tilling-Stevens petrol electric chassis thoroughly overhauled and in excellent condition. Suitable for tower wagon.—Apply Commercial Car Hirers, Ltd., 112A, Junction Road, Upper Holloway, London, N.19.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	Aug. 12	620	619	— 1	19	10,449	+ 557
Aberdeen Corporation	,, 13	3,075	3,851	+ 776	19½	37,450	+ 8,009
Ayr Corporation	,, 16	925	1,066	+ 141	13	12,268	+ 1,786
Belfast City	,, 15	8,372	11,063	+ 2,691	20	206,022	+ 51,385
Birkenhead Corporation	,, 17	2,408	3,358	+ 950	19½	55,852	+ 11,765
Birmingham Corporation	,, 9	24,527	24,878	+ 351	19	485,547	+ 44,955
do. Motor Buses	,, 9	2,151	2,306	+ 155	19	33,472	+ 4,166
Blackburn Corporation	,, 13	2,172	2,489	+ 317	20½	48,349	+ 10,290
Bradford Corporation	,, 16	10,802	12,381	+ 1,579	21	229,331	+ 48,139
Burnley Corporation	,, 16	2,597	3,206	+ 723	..	..	..
Burton-on-Trent Co.	,, 17	459	547	+ 88	20	9,029	+ 1,659
Bury Corporation	,, 10	2,881	2,60	+ 179	18½	46,205	+ 6,852
Chatham & District	,, 7	1,729	2,086	+ 357	31	46,511	+ 6,416
Cork Electric	,, 7	641	880	+ 239	31	20,207	+ 519
Derby Corporation	,, 16	1,631	2,066	+ 435	20	38,332	+ 7,832
Dundee City	,, 6	1,917	2,515	+ 598	11½	30,635	+ 7,354
East Ham Corporation	,, 16	1,782	1,984	+ 202	12½	28,352	+ 8,516
Edinburgh	,, 9	9,828	11,734	+ 1,906	5½	74,022	+ 15,336
Glasgow Corporation	,, 16	28,905	32,146	+ 3,241	11	349,630	+ 35,845
Glossop (U.E. Sup. Co.)	,, 16	184	246	+ 62	38	7,372	+ 1,295
Halifax Corporation	July 15	2,553	3,513	+ 960	15½	55,134	+ 13,591
do. Motor Buses	,, 15	60	81	+ 21	15½	1,249	+ 325
Huddersfield Corporation	Aug. 16	4,937	5,518	+ 581	20	93,659	+ 22,133
Ilford U.D. Council	,, 16	1,153	1,316	+ 163	19½	24,276	+ 4,060
Ipswich Corporation	,, 16	1,066	1,185	+ 119	20	18,966	+ 3,150
Isle of Thanet	,, 13	817	2,787	+ 1,970	45½	34,777	+ 23,201
Kilmarnock Corporation	,, 16	265	278	+ 13	13½	3,917	+ 559
Lanarkshire	,, 7	3,777	4,044	+ 267	31	109,836	— 1,633
Leeds City	,, 16	14,855	17,247	+ 2,392	20	335,802	+ 77,653
Leicester Corporation	,, 16	4,768	6,033	+ 1,265	..	..	..
Leyton U.D. Council	,, 14	2,659	3,295	+ 636	20	63,705	+ 18,741
Liverpool Corporation	,, 16	20,017	24,751	+ 4,734	32½	703,273	+ 120,158
London County Council	,, 20	75,316	79,198	+ 3,882	20½	1,653,068	+ 347,777
Maidstone Corporation	,, 14	331	441	+ 110	19½	7,720	+ 2,009
Manchester Corporation	,, 16	26,856	31,549	+ 4,693	20	602,291	+ 104,958
Newcastle-on-Tyne Cor.	,, 9	9,027	9,354	— 573	19	182,046	+ 11,072
Northampton Cor.	,, 8	1,201	1,683	+ 482	19	21,492	+ 7,783
Nottingham Corporation	,, 14	5,695	7,543	+ 1,848	20	141,216	+ 24,763
Oldham Corporation	,, 17	3,589	4,788	+ 1,199	21	93,687	+ 19,422
Reading Corporation	,, 14	1,575	1,760	+ 185	19½	31,771	+ 5,861
Rotherham Corporation	,, 11	2,755	2,044	— 712	19½	42,905	— 488
Sheffield Corporation	,, 17	13,757	17,538	+ 3,781	20½	352,520	+ 73,131
Southampton Cor.	,, 13	2,976	3,026	+ 50	19½	54,398	+ 4,093
Southend-on-Sea Cor.	July 23	1,492	3,057	+ 1,565	17	73,749	+ 15,973
South Shields Cor.	Aug. 2	1,282	1,497	+ 214	18	24,834	+ 4,315
Sunderland Corporation	Aug. 17	2,258	3,453	+ 1,195	20	59,141	+ 16,599
Torquay Tramways	,, 7	1,683	2,111	+ 428	31	32,366	+ 5,718
Tyneside Trys. & Trmrds	July 28	1,092	1,434	+ 352	4	3,880	+ 42
Wallasey Corporation	Aug. 16	2,480	3,428	+ 948	19½	53,203	+ 13,729
Walsall Corporation	,, 16	1,266	1,353	+ 87	20	27,922	+ 3,210
Walthamstow U.D. Coun.	,, 16	1,792	1,915	+ 123	20	35,963	+ 5,921
Warrington Corporation	,, 14	788	878	+ 90	19	17,282	+ 2,664
West Ham Corporation	,, 14	4,939	5,326	+ 387	19½	107,136	+ 20,045
Wolverhampton	,, 20	1,746	2,207	+ 461	20	41,261	+ 5,478

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Wks.	Aggregate. 1918-19	Increase or Dec
Anglo-Argentine	Aug. 12	£58,806	£63,051	32	£1,785,350	+ £14,721
Ballarat and Bendigo (4 wks)	May 25	3,286	3,266	8	7,557	+ 176
Brazilian Traction (Mlrs.)	June	9,087,000	9,369,000	26	53,963,000	+ 4,270,000
Brisbane	July	36,360	41,610	20	202,155	+ 14,371
British Columbia $	June	488,873	411,805	52	7,062,599	+ 1,076,122
Buenos Aires Lacroze	July	41,145	45,222	4	45,222	+ 4,077
Burmah Tram. & Light Rs.	July 31	34,848	44,045	52	450,448	+ 115,668
Calcutta Rs.	Aug. 16	83,212	90,400	32½	..	+ 370,584
Carthagena and Herrerias	July	5,491	4,183	30	20,974	— 12,149
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	July	1,968	2,637	52	24,889	+ 6,760
Hong Kong $	July 5	14,394	14,650	27	388,878	+ 26,299
Kalgoorlie	April	2,876	2,907	18	10,400	— 71
La Plata	July	6,721	5,317	31	32,774	+ 2,840
Lima	June	42,161	47,811	26	282,907	+ 26,682
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras Rs.	Aug. 12	42,117	46,273	32	592,737	— 11,186
Manila $	May	175,500	183,050	21	1,048,433	+ 199,683
Montevideo	July	31,684	24,139	39	334,076	+ 33,551
Para	July	24,398	24,659	34	196,786	+ 2,892
Pernambuco	Aug. 17	4,277	774	32½	168,334	+ 21,511
Peruvian $	July	987,300	1,058,730	..	..	..
Rangoon	July	6,054	6,502	30	45,188	+ 1,455
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore $	June 21	12,690	15,228	25	385,872	+ 47,672
Toronto $	June	1,035,932	842,697	26	6,133,296	— 222,873
Winnipeg $	June	293,140	112,615	26	1,874,640	+ 63,302

CARS, MOTORS, CONTROLLERS.

(DICK, KERR SYSTEM.)

THE
ENGLISH ELECTRIC COMPANY
LIMITED,
Queen's House, Kingsway,
LONDON, W.C.2.

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THE
Tramway AND Railway World

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SATURDAY, AUGUST 30, 1919.

OMNIBUS AID TO TRAMWAYS.

The motor omnibus was originally designed to compete with tramways, and there are still numbers of people who regard the two modes of transit as competitive and almost antagonistic. It is true that omnibuses compete with tramways for passenger traffic on the streets of London and elsewhere, but the real factors in the case have largely changed competition into co-operation, and made the omnibus a valued auxiliary of the tramways. Traffic necessity has imposed the larger view and the broader policy upon transport authorities. Accepting the teaching of experience, it behoves those in charge of transport facilities to lay down a comprehensive plan for the co-ordination of the two modes of transit. Tramways are better suited than omnibuses for dealing with short-distance and closely congested street passenger traffic; but because it is called upon to make fewer stops and has a freer run, the omnibus has an advantage in rapidity over the tramcar. Again, the high price of rails and the increasing costs of labour, prohibit long extensions of tramway tracks on routes where the demands for services grow ever more insistent. Only the other day an important corporation in the North of England turned down the proposals of the tramways committee for the construction of new lines urgently required simply because of the enormous expenditure the scheme involved. According to reports from New York, there has arisen a strong movement in favour of supplementing the tramway services there by omnibus lines. The New York correspondent of a London newspaper has stated that opinion in New York strongly favours the idea of letting the tramways die out and concentrating effort on the development of omnibus services. Of course, that is sheer exaggeration; no such idea exists in the mind of anyone who understands the situation, but that such a report should have come from the city which proudly claims the distinction of having been the foremost in promoting tramway enterprise is deeply significant. If a genuine solution of the traffic problem is to be attained, all notion of antagonism between the tramway and the omnibus must be dropped decisively and finally. It is adjustment that is required, and both methods of transit must be utilised to the best advantage. Controlled by a single transport authority, or otherwise co-ordinated, omnibus and tramcar may supplement each other. The superior mobility of the omnibus enables it to vary routes, while the larger carrying capacity of the tramcar and the definite order of the routes upon which it travels, make it more serviceable to the great and constant streams of passengers from thoroughfare to thoroughfare. In brief, the omnibus is a vehicle well suited for long-distance journeys, and the tramcar meets the requirements of short-distance and inner-urban traffic. A corollary of this offers still greater relief to transport authorities. Extension of tramways is at present prohibited by costs of tracks and equipment. The omnibus needs no rails and no overhead equipment, and can be placed on any well-built road at any moment. Transport authorities may, therefore, postpone tramway extension schemes and employ omnibus services. When the happier time of the future comes, the omnibus will have developed a traffic and enable the authority to lay the tramway track with the assurance that the service will be financially supported.

STREET TRAFFIC REGULATION.

SUGGESTED CODE OF SIGNALS.

The Commissioner of Police of the Metropolis informs us that a Committee appointed by him has been sitting at New Scotland Yard to consider the powers and duties of the police in relation to the regulation of traffic in the streets on other than special occasions, in what manner those duties shall be promulgated in simple terms for the guidance of the police, and the advisability of making uniform rules for traffic regulation throughout the Metropolitan Police District.

In their report the Committee lay special stress on the necessity for signals to be codified and issued as instructions to drivers. They are much struck by the present diversity of opinion, even amongst experienced drivers, as to what are the correct signals to indicate to other drivers the intended movements of the vehicle, and with the advantage that would accrue were signals standardised.

The code of signals suggested is as follows :—

FOR MOTORS.

(All signals to be given on the right hand side of car, and in ample time to be of use).

Right forearm vertical	Stop.
Right arm horizontal	Turning to right.
Right arm horizontal and then swept to the left	Turning to left.
Right arm horizontal, palm of hand down, and moved slowly up and down	Slow down.
Right arm waved low from rear to the front	Pass.

FOR HORSE DRIVERS.

Whip rotated above head.. ..	Turning.
Whip raised vertically	Stop.

It is obvious that one code only is possible owing to the confusion that would arise were duplicate signals admissible.

LONDON TRANSPORT PROPOSALS CRITICISED.

The Executive Committee of the London Labour Party have issued a statement respecting the Report of the Select Committee on Transport (Metropolitan Area). While agreeing to a considerable extent with the report, they consider it impracticable to separate the transit policy from that of other metropolitan public services, *e.g.*, housing. While agreeing that there ought to be a supreme traffic authority for Greater London, they insist that the proposed authority will be neither supreme nor representative of London, and that it will only make confusion worse confounded by adding another authority to the far too numerous conflicting public bodies already existing in the Metropolis.

Supremacy, they contend, must be exercised by the traffic-owning and operating bodies, or injury will be done to the public interest by the uncertainty and confusion created by attempts to control various traffic concerns by a body accepting no financial responsibility for the consequences of their directions. They strongly condemn the bureaucratic nature of the proposal made in the report of the Committee, and suggest that the area of the London County Council should be enlarged so as to comprise the whole of the Metropolitan Police District, and that the Council should have powers to own and operate all forms of passenger transit over the Greater London traffic area, and generally to act as the supreme traffic authority for the Metropolis.

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TRAMWAY EMPLOYEES' DEMANDS.

ARBITRATION PROPOSED.

After failing to achieve their purpose piecemeal by making separate application to each local body and tramway company for increased wages, the Transport Workers' Federation have continued negotiations with representatives of the Tramways and Light Railways Association and the Municipal Tramways Association, but the employers have not been able to accede to the demands for a further increase in wages. To avert a deadlock, appeals were made by the men's representatives to the Ministry of Labour to intervene, but the appeals evoked no response, excepting that the Ministry told both contending parties that they must adjust their differences themselves. Under those circumstances, representatives of the Transport Workers' Federation asked for a further conference. This was held on Wednesday and lasted for two hours. At its conclusion, Mr. J. Beckett, secretary of the Municipal Tramways Association, stated that the transport workers' representatives had made a suggestion that the men's demands should be referred to arbitration, and it had been agreed that this proposal should be submitted to national conferences of the municipalities having tramways undertakings and the private companies concerned, to be held separately in London next week. The employers' representatives had undertaken to give the Transport Federation a reply to the arbitration suggestion by September 4th.

Mr. Ernest Bevin, of the Transport Workers' executive, said the matter was to be further considered by both parties in the coming week. He added, "Feeling in the country is so tender that it is unwise to say anything more."

ROTHERHAM TROLLEY OMNIBUS COSTS.

A Rotherham Corporation return analyses the working costs of the trolley omnibus for the month of May, 1919, and the corresponding month a year ago as follows :—

	Month ending May 30th, 1919.		Corresponding Month Last Year		
Allocation.	Cost.	Car Mile.	Cost.	Car Mile.	+ Increase. — Decrease
	£ s. d.		£ s. d.		£ s. d.
Management	19 19 2	.512	16 7 7	.379	+ 3 11 7
Inspectors	12 8 1	.319	14 13 1	.339	— 2 5 0
Motormen	117 9 10	3.017	68 1 7	1.578	+ 49 8 3
Conductors	90 19 10	2.337	49 7 6	1.144	+ 41 12 4
Car Repairs	167 6 5½	4.297	101 4 5	2.347	+ 66 2 0½
Car Cleaning	15 14 7	.402	18 5 2½	.423	— 2 10 7½
Car Lubrication ..	40 3 6	1.033	14 15 0	.342	+ 25 8 6
Depot	8 9 9	.220	7 1 1	.163	+ 1 8 8
Overhead Equipment	1 14 11	.044			+ 1 14 11
Tyres	33 7 2	.857	35 2 2	.814	— 1 15 0
Road Maintenance ..	12 4 11	.375	13 5 7	.375	— 1 0 8
Current	48 6 6	1.241	69 14 8	1.617	— 21 8 2
	568 4 8½	14.653	407 17 10½	9.521	+ 160 6 10

For the month of June the cost of running of the petrol omnibus is given as 14.653d. per car mile. In June, 1918, the cost was 9.521d.

The following is an analysis of the operating costs of the petrol omnibus for June :—

	Month ending June 30th, 1919.		Corresponding Month Last Year.		
Allocation.	Cost.	Car Mile	Cost.	Car Mile.	+ Increase.
	£ s. d		£ s. d.		£ s. d.
Management	15 17 9	.512	12 6 0	.379	+ 3 11 9
Inspectors	9 17 9	.319	11 0 1	.339	— 1 2 4
Motormen	90 6 3	2.913	72 4 3	2.229	+ 18 2 0
Conductors	77 0 9	2.485	49 14 4	1.534	+ 27 6 5
Car Repairs	59 19 7	1.935	59 13 1	1.847	+ 0 6 6
Car Cleaning	12 7 9	.399	18 11 1½	.572	— 6 3 4½
Car Lubrication ..	39 4 9	1.263	13 10 2	.417	+ 25 14 7
Depot	6 1 8	.220	5 6 0	.163	+ 1 9 8
Tyres	27 19 9	.902	30 16 1	.951	— 2 16 4
Petrol	143 12 4	4.633	176 5 10½	5.442	— 32 13 6
	483 2 4	15.581	449 7 0	13.867	+ 33 15 4

Montreal City Tramway Experiments.—As everyone knows, tramway troubles are not confined to this country, and it is interesting to note the efforts being made to overcome difficulties elsewhere. Montreal City Tramways are faced with a deficit, and the Tramways Commissioners are making experiments with the object of increasing revenue without raising fares. One of the plans is to institute a more speedy service on the main routes with fewer stopping-places. Mr. Beaudry, secretary of the Commission, in making his report to the first sitting, said that the fact of the matter was that the cost of operation was continuously rising, and in order to neutralise this, greater efficiency and saving in operation expenses was the objective toward which the Commission was bending its energies. The rates therefore would depend entirely on the balance which could be maintained between these two factors. Every effort was being made to meet rising expenses by every means except a rise in rates, but, said Mr. Beaudry, we cannot say yet what will happen. So far as an underground or elevated system is concerned Montreal was not yet large enough for either, as the amount of traffic was not great enough to warrant the great expenditure which would be necessary to either system Therefore, in view of this, relief for transportation difficulties would have to be achieved for some time by improvement and extens on of the surface lines.

MISCELLANEOUS NEWS AND NOTES.

Blackpool Strike.—The strike of the electricians, painters and coach bodymakers in the employ of Blackpool Corporation still continues.

Proposed Nottingham Extensions.—Nottingham Tramways Committee propose to made application for Parliamentary powers to extend the tramways to Beeston and Hacknall.

Fares Not Yet Raised.—Up to the present time only three of the important municipal tramways in the country have, we believe, not raised their fares since 1914. These are Aberdeen, Glasgow and Newcastle.

Prepaid Tickets at Wallasey.—Wallasey Tramways Committee have decided to issue prepaid tickets as from September 1. These tickets will be purchaseable in packets of thirteen 1d. tickets for a shilling, and thirteen 1½d. tickets for one shilling and sixpence.

Burnley Extensions Dropped.—Burnley Tramways Committee have unanimously agreed not to proceed with the proposals for tramway extensions. The total length of the new line suggested was about six miles, and the cost of construction was estimated at £140,000, or including new cars, £250,000.

Lanarkshire Miners and Tramway Fares.—As a result of friction between the Lanarkshire Tramways Company and Lanarkshire miners over the question of fares, the Executive Committee of the Lanarkshire Miners' Union proposed to place the facts before the Board of Trade.

Warning to Tramway Passengers.—Leaning over the side of a tramway car on which he was travelling between Waterlooville and Cosham, Hants, Edward Chase, of the Capital and Counties Bank, Waterlooville, struck his head against a tramway standard, and died shortly afterwards as the result of his injuries.

New Tramway Track at Sheffield.—In order to construct a tramway track from Woodseats to Beauchief, Sheffield Corporation has purchased 26,250 square yards of land in Abbey Lane. By this means the lane will be widened to 100 ft., and the new track will be laid on sleepers.

Relative Value of Tramway Labour.—Commenting on the fresh demands so confidently put forward by the Transport Workers' Federation, the Blackpool *Gazette* asks: "What should be the remuneration of a skilled craftsman if a tram driver is going to average nearly £4 per week?"

Proposed Sunday Cars at Rothesay.—At a recent meeting of Rothesay Town Council, Provost M'Millan announced that the Rothesay Tramway Company were prepared to provide the town with electric lighting along the sea-front on very advantageous terms, on condition that they were allowed to run the Ettrick Bay service of cars on Sundays.

Offices of the Ministry of Transport.—In a few weeks it is expected that the Ministry of Transport will be housed in the old Board of Trade headquarters at Whitehall Gardens. The Board of Trade will be moved to the offices in the newest block of Government building overlooking Great George Street and St. James' Park, at Storey's Gate.

Halfpenny Fares at Aberdeen.—The Tramways Committee of Aberdeen are discussing the abolition of halfpenny fares. The estimates for the current year indicate a deficit of £5,000, and it is clear that some change must be made. The abolition of the halfpenny fare is, however, strongly opposed by some members of the Committee.

Ex-Soldiers Replace London Women Conductors.—The policy of the London County Council is to dispense with the services of women conductors at the earliest possible moment, and to replace them by former conductors returning from service with the forces and other demobilised men. In June last 2,051 men had returned and there were only 129 conductors remaining to be demobilised, and this number has since been considerably decreased.

Increased Fares Proposals.—The Hastings Tramways Company have applied to the Board of Trade for a modification of the statutory provisions regulating the charges made by the Company. Dudley and Stourbridge Tramways Company propose to raise the minimum fare to 1½d., but a local paper urges that so far as it is possible for the local authorities to stave off the increase they ought to do so.

Non-Committal Decimal Coinage Report.—The Royal Commission which has been inquiring into the decimal system of coinage has completed the taking of evidence and is now considering its report, which is expected shortly to be presented to the Home Secretary. It is reported that the conclusions arrived at by the Commission are of a non-committal character and that no legislation is likely to be recommended.

Withdrawal of Penny Fares at Llandudno.—At a meeting of the Llandudno Council there was some discussion on the suspension of the penny fare. Mr. Conolly said he had discussed the matter with Mr. A. G. Balfour, general manager of the Llandudno and Colwyn Bay Electric Railway Company, who said that the company were entitled to make the change. Eventually the Council agreed that the matter should be reported to the Board of Trade.

Motor Omnibus Service Proposed at Gosport.—Gosport Council is considering the question of starting a public motor omnibus service. At the last meeting of the Council it was decided to consider a scheme for running omnibuses in the town and outlying districts, which would be controlled by the Council. One councillor said that a service of motor omnibuses connecting up Stokes Bay, Lee-on-the-Solent, Alverstoke, and other places not touched by tramways, would, he was sure, prove very profitable. The scheme was referred to the Road and Works Committee.

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Mansfield Light Railways.—The Light Railway Commissioners have submitted to the Board of Trade for confirmation an order for the construction of a light railway in Mansfield, Mansfield Woodhouse, and Southwell in extension of the light railways authorised by the orders of 1901 and 1907.

Underground Railway Stoppage.—Owing to a failure of power from the Chelsea generating station at 4.30 on Thursday afternoon the electric services on the District Railway and all the Tube railways except the Central London were completely held up for half-an-hour. In consequence it was possible only to run a partial service during the early part of the evening, great delay being occasioned to homeward-bound passengers.

Newcastle Women Employees' Farewell Tea.—The women employees of Newcastle Corporation tramways, numbering about sixty, held a tea at the Haymarket car sheds recently. Among the guests were the deputy Lord Mayor (Councillor Richard Mayne), chairman of the Tramways Committee, and Mr. Ernest Hatton, the general manager. Mr. Mayne thanked the women employees for what they had done in maintaining the efficiency of the service while the men were serving with the forces.

Barrow-in-Furness Tramways.—A special meeting of Barrow Town Council will be held on September 23 to decide whether the Corporation shall exercise their powers under Section 43 of the Tramways Act of 1870 and the Barrow-in-Furness Tramways Order in 1903, and also under an agreement with the British Electric Traction Company to require the sale to them of the tramway undertaking. A resolution will be submitted in favour of the purchase and authorising a tramway sub-committee to take the necessary steps to carry the proposal into effect.

Motor Omnibuses at Oldham.—The general manager and engineer of Oldham Corporation tramways gives the following particulars of the working of the two motor omnibuses during the year ended March 25, 1919:—Gross capital expenditure, £3,380; traffic revenue, £713; total revenue, £716; working expenses, £1,627; income tax, £4 10s.; deficiency, £914 16s.; miles run, 15,375; passengers carried, 120,319; percentage of working expenses to receipts, 226.91; average revenue per mile, 11.187d.; average expenses per mile, 25.397d.; average fare paid per passenger, 1.409d.

Fine for Dangerous Driving.—At Blackpool, on August 25, a driver pleaded not guilty to a charge of dangerously driving a car of the Blackpool, St. Anne's, and Lytham Tramways Company along Central Drive. It was stated that on June 24 he drove a car from the direction of the Central Station at a high speed. On the roadway opposite a shop was a lorry which the car could not pass, and on which was a man who waved for the driver to stop. The latter took no notice, however, and the car struck the lorry. The man was thrown upon his side and was so severely hurt that he had to be taken to the hospital. The defendant, who expressed his regret, was fined 20s.

Southampton Omnibuses for Long Journeys.—Alderman Dunsford, Chairman of Southampton Corporation Tramways Committee, has stated that it is not the intention of the Committee to encourage short rides on motor omnibuses. Such a policy would tend to introduce competition with the tramway cars. The omnibuses are intended to open up certain districts. For shorter rides passengers should take the tramway cars. The Committee have so far retained 1d. fares on the tramways, but there was no hope at present of 1d. sections being arranged on the omnibuses. "The financial position of the tramways," said the Chairman, "was very serious."

New York's Great Turbine.—The American "Electrical Review" reports that the Interborough Rapid Transit Company, of New York, has now in operation in its 74th Street power-house a turbine which has a normal capacity of 60,000 kw., and a maximum capacity for two hours of 70,000 kw. The machine is, therefore, the largest prime mover in the world. It is designed to meet the increasing demands for transportation in New York City, and the opening up of the new subway system and extension of various other services. The machine, although consisting of three separate elements—one high pressure and two low pressure—is started, synchronised, and controlled as a single unit.

Nottingham's New Cars.—The first of the twenty-five new cars which were ordered by Nottingham Corporation from the English Electric Company, Ltd., some time ago are expected to be delivered towards the end of September. These cars are of the type of the standard car adopted by Nottingham some years ago, of which an illustration and description were given in our issue of September 12, 1918. New bodies have already arrived for some of the cars which have been awaiting repair. Within the last few weeks the number of drivers and conductors still in the Army has been reduced to between forty and fifty men, most of whom are with the Rhine Army. As the men return from the Army the number of women employed is being reduced.

Plymouth Tramways.—Commenting on the appointment of Mr. H. P. Stokes as general manager of the Corporation tramways, the *Plymouth Western Mercury* says that he will take up the work at a critical time, but he will find that the foundation of a great business and an important public service has been well laid. The tramways of Plymouth cannot be completely successful until the whole system is unified and important links are made at Devonport between the arterial lines through Union Street and the two sections of the outer ring which enter the town at Fore Street and Morice Square. These junctions will reduce congestion and avoid delays. The date at which the Union Street line will be taken over is rapidly approaching.

London County Council Men Reinstated.—At the time of the strike in 1913 on the L.C.C. Tramways a number of men were dismissed. The Tramways Department has now decided to reinstate the dismissed men of military age and fitness on their return from the Services. The earlier policy was to allow the men on discharge to rejoin the tramways as new hands with a loss of all privileges their previous service had brought them. The men's union, however, pointed out that the fit men dismissed after the strike were without the L.C.C.'s allowances for dependants while in the Forces, while their fellow-strikers taken back because of temporary unfitness for immediate service were given these allowances when called up under the Military Service Acts.

London-Paris Air Service Begun.—The London-Paris air service was successfully inaugurated on Monday, August 18, three aeroplanes leaving London on that day. Two of the machines were an Airco 4 and an Airco 16, and the third a Handley-Page equipped with twin Rolls-Royce engines. Both the Airco machines were also fitted with Rolls-Royce 275 h.-p. engines, and their speed was about 120 miles an hour. One of the machines made a return journey. Leaving Hounslow at 9.10 a.m., it arrived in Paris at 11.40 a.m., and leaving again on the return at 12.40 p.m., reached Hounslow at 2.45 p.m. The other two machines made the journey to Paris in good time. The present fare is fifteen guineas for a single journey. Parcels and luggage are carried, but not mails, as the post office fear that the service will not be sufficiently reliable.

Huddersfield Extensions.—At the monthly meeting of Huddersfield Council on August 20, Alderman Smith, the Mayor, speaking in regard to the proposed extension of the tramways to Brighouse, said that the Council ought not to go on with the extension, as he thought there was no possibility of it being made to pay owing to the greatly increased construction costs compared with the estimates of 1914. The cost would be three times as much as in 1914, and he did not think there was any moral obligation upon them to carry out a bargain made four years ago at the old prices. Councillor Toppin said, however, that the extension could not be abandoned, as there was a legal as well as a moral obligation upon the Council to proceed with the work. Subsequently the minutes of the Tramways Committee, which provided for the appointment of a sub-committee to carry out the agreement, were approved.

Wages at Newcastle.—In an interview with the representative of the local *Chronicle*, Councillor Mayne, Chairman of the Newcastle Tramways Committee, said that Newcastle was better placed than most towns with regard to wages of tramway employees. The men start at 57s. a week and receive 1s. advance every six months until a maximum of 62s. is reached. The maximum would, therefore, be reached in three years, but at the end of seven years the men receive another 1s. as recognition of merit and long service. Councillor Mayne further pointed out that the hours worked in Newcastle were four less than those of the National award. Mr. Ernest Hatton, General Manager of the Tramways, said that if the National demand for a qualifying period for the maximum wage was to be not more than six months, it would mean an acknowledgment that tramway work was unskilled labour and they would simply go into the market for unskilled labour. He thought that Newcastle had met the men very fairly on the question of wages and hours.

Death Caused by Overhead Wire Breaking.—An inquest was held by the district coroner at Lytham into the death of Thomas Hodson, who died at the Lytham Cottage Hospital as the result of an accident while travelling on a car of the Blackpool, St. Anne's and Lytham tramways. William Westhead, who was travelling with the deceased on the top of a car, said that the trolley wire snapped and he ducked on to his knees and next found himself on the floor near the trolley standard. When he got up Hodson was nowhere to be seen, but the witness found him lying in the 4-ft. way at the back of the car. The conductor said she saw him drop from the top when the car was in motion. James Leadbetter, the chief overhead wireman of the tramway company, in his evidence said that the line was electrified seventeen years ago, and there had been only eight breaks of the trolley wire. This was a record which the witness did not think had been equalled. The medical evidence showed that the deceased suffered from cerebral concussion and hemorrhage from which he died, and the coroner found that Hodson died as a result of injuries received through the accident.

CONTRACT FOR CARS.

Southend-on-Sea Corporation have placed an order for six double-deck top-covered cars and one toast-rack car, complete with electrical equipment, with the Brush Electrical Engineering Company, Ltd. The amount of the contract is stated to be £17,886.

PERSONAL.

Mr. H. P. Stokes has been appointed general manager of Plymouth Corporation tramways, and will succeed Mr C. R. Everson who is retiring. The salary of the new general manager will be £700, rising by £50 per annum to £800. Mr. Stokes, as reported in our last issue, has just received a similar appointment at Doncaster, but he has decided to accept the Plymouth appointment. For the past six years he has been electrical engineer and manager of Bexley Council tramways, during which the undertaking has been extended and traffic has much increased. For six years previously, Mr. Stokes was assistant engineer and manager of Burton Corporation tramways and electricity undertaking, and before that he was electrical engineer and tramways manager of Ilkeston Corporation for over eight years.

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Mr. James Dobson, who has recently been appointed general manager of Southampton Corporation tramways, has had much experience of tramway work abroad. He spent two years in the construction and equipment of Johannesburg municipal tramways as assistant in the manager's office on the engineering staff. From 1906 to 1908 he was in charge of the electrification of the Kimberley-Victorian tramways and was responsible for the maintenance of the system and control of the traffic. From 1908 to 1912 he was superintendent of construction and equipment of the rolling stock of the Rio de Janeiro Tramways, Light and Power Company, which then had 300 cars and 180 trailer cars. The following year he became superintendent of rolling stock and traffic manager of the Rio de Grande Tramways, Light and Power Company, Pelotas, Brazil. On returning to England he was appointed engineer and manager of the Barrow-in-Furness tramways and motor omnibus service, subsequently becoming manager of the Gravesend and Northfleet tramways.

FINANCIAL.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended August 27 amounted to £78,121, an increase of £8,104 as compared with the corresponding period last year. The route mileage was 141.67, the same as a year ago. From April 1 (the commencement of the financial year) to August 27 (twenty-one weeks and two days) the total receipts were £1,731,398, an increase of £356,089 in the corresponding period of 1918.

Aberdeen Suburban Tramways Company.—The report for half-year ended July 31st last states that profit amounts to £2,908, which, with amount brought forward, makes £5,393. Owing to improved returns from invested capital and otherwise, directors are in a position to recommend an increase in dividend. They propose to add £1,200 to renewal and depreciation account, which will then stand at £20,300, pay a dividend at the rate of 7 per cent. for past year, and carry forward £1,907.

Aberdeen Corporation Tramways.—The results for the year ended May 31 last constituted a record, said Dean of Guild Meff, convener of the Tramways Committee, in presenting the report to the Town Council. The total receipts amounted to £140,901, showing an increase of over 20 per cent. compared with the previous year. The working expenses were £108,457, or an increase of 40 per cent., due mainly to the increase in wages. The net surplus was £6,836, a decrease of 44 per cent. compared with the previous year. Aberdeen is one of the few tramways still operating with the pre-war scale of fares, but the results of the past year show that it will no longer be possible to carry on the undertaking on sound business lines unless alterations in the fares are made. This matter is being considered at the present time by a sub-committee. The total wages paid in 1914 were £22,611; last year wages had increased to £56,308, and this year the Corporation is faced with a further addition of about £18,000, even if no further increases are granted.

Oldham Corporation Tramways.—In his annual report for the year ended March 25, 1919, Mr. William Chamberlain, general manager and engineer, states that the financial results for the year constitute a record. The total receipts amounted to £184,029, an increase of £32,618 as compared with the previous year, and the working expenses to £124,336, an increase of £17,399. The profit on working was £59,693, or £15,219 more than in the previous year. Including interest received (£6,507), there is a balance of £66,200, which is allocated as follows:—Interest on loans, £12,128; contributions to sinking funds, £12,538; interest to sinking funds, £7,485; rent of leased lines, £5,348; income tax deductions, £8,557; renewals reserve fund, £19,230; balance (deficiency) on motor 'buses, £914. Passengers numbered 31,229,035, and car miles 2,093,946. The average revenue per car mile was 21.093d. (compared with 17.132d. a year ago), and the working expenses 14.215d. (compared with 12.099d.). The percentage of working expenses to receipts was 67.56. Energy consumption averaged 1.759 units.

Tyneside Tramways and Tramroad Company.—Presiding at the annual meeting on Wednesday, the chairman (Mr. J. T. Merg) said the half-year had been a peculiarly arduous one. Everything had been altered; in every direction they had met difficulties, and although the hardships of war had ceased, to a great extent the hardships of peace time had been almost as great. Not the least of their difficulties was the number of holidays that had been created, and whilst these holidays had to a great extent increased their holiday traffic, they had very largely reduced the ordinary traffic. They had suffered as much from a plethora of traffic as they had suffered from a want of traffic. He referred to the loyalty of the staff, and he thanked them in the name of the company for their faithfulness and resourcefulness during all difficulties. A dividend of 5 per cent. on preference ordinary shares (less income tax) was declared, payable on September 1.—The report states that the surplus of receipts over expenses is £6,943; £2,295 was brought forward, making a total at credit of profit and loss of £9,238, and after deducting interest on debentures, loans, etc., amounting to £1,031, there remains an available balance of £8,206. The dividends on both the preference and ordinary shares are at the rate of 5 per cent. per annum (less income tax); allocations to reserve for renewals, depreciation and other contingencies amount to £2,500 (which, with £968 interest on investments will increase the fund to £37,036), and £1,758 is carried forward. Traffic receipts show an increase of £2,388. A sum of £1,500 has been charged against special reserve account in respect of increased cost of maintenance during the half-year.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1918.	Incr. or Dec.
Aberdare U.D.C. ..	Aug. 19	526	543	+ 17	20	10,933	+ 573
Aberdeen Corporation ..	,, 20	2,804	3,931	+ 1,127	11½	41,382	+ 9,136
Ayr Corporation ..	,, 23	1,008	1,104	+ 96	14	13,372	+ 1,882
Belfast City	,, 22	8,587	10,309	+ 1,722	21	216,331	+ 53,107
Birkenhead Corporation	,, 24	2,377	3,276	+ 899	20½	89,128	+ 12,664
Birmingham Corporation	,, 16	23,529	24,962	+ 1,433	20	510,510	+ 46,388
do. Motor Buses	,, 16	1,692	1,911	+ 219	20	35,363	+ 4,285
Blackburn Corporation ..	,, 20	1,927	2,478	+ 551	21½	50,827	+ 10,840
Bradford Corporation ..	,, 23	11,613	11,914	+ 301	22	241,245	+ 48,440
Burnley Corporation ..	,, 23	2,568	3,114	+ 546	...	...	...
Burton-on-Trent Cor. ..	,, 24	454	550	+ 96	21	10,478	+ 1,754
Bury Corporation ..	,, 10	2,281	2,560	+ 179	18½	46,205	+ 6,852
Chatham & District ..	,, 14	1,640	1,912	+ 272	32	48,424	+ 6,689
Cork Electric	,, 14	704	856	+ 152	32	21,063	+ 671
Derby Corporation ..	,, 23	1,646	2,123	+ 477	21	40,456	+ 8,309
Dundee City	,, 6	1,917	2,515	+ 598	11½	30,835	+ 7,354
East Ham Corporation ..	,, 23	2,081	1,850	— 231	20½	40,503	+ 8,235
Edinburgh	,, 16	9,386	11,783	+ 2,397	6½	85,806	+ 17,733
Glasgow Corporation ..	,, 23	29,118	32,375	+ 3,257	12	382,006	+ 39,412
Glossop (U.E. Sup. Co.) ..	,, 23	216	214	— 2	34	7,536	+ 1,293
Huddersfield Corporation	,, 22	4,537	5,205	+ 667	21	103,852	+ 22,351
Ilford U.D. Council ..	,, 23	953	1,275	+ 322	20½	25,546	+ 4,389
Ipswich Corporation ..	,, 23	1,028	1,110	+ 82	21	20,077	+ 3,285
Isle of Thanet ..	,, 20	949	2,724	+ 1,775	46½	37,502	+ 24,836
Kilmarnock Corporation	,, 23	270	277	+ 7	14½	4,194	+ 566
Lanarkshire	,, 14	3,971	4,181	+ 210	32	113,517	— 1,423
Leeds City	,, 23	16,984	17,578	+ 1,594	21	353,381	+ 79,961
Leicester Corporation ..	,, 23	4,956	6,135	+ 1,179	..	..	..
Leyton U.D Council ..	,, 21	2,747	3,184	+ 437	21	66,889	+ 19,178
Liverpool Corporation ..	,, 23	20,176	23,867	+ 3,691	33½	727,141	+ 123,859
London County Council ..	,, 27	70,017	78,121	+ 8,104	21½	1,731,398	+ 356,089
Maidstone Corporation ..	,, 21	324	443	+ 119	20½	8,163	+ 2,128
Manchester Corporation	,, 23	27,941	31,406	+ 3,465	21	640,697	+ 108,903
Newcastle-on-Tyne Cor.	,, 23	9,696	9,395	— 301	21	200,875	+ 19,614
Northampton Cor. ..	,, 8	1,201	1,683	+ 482	19	21,492	+ 7,783
Nottingham Corporation	,, 21	5,703	7,422	+ 1,719	21	148,639	+ 26,483
Oldham Corporation ..	,, 24	4,133	5,069	+ 936	22	96,157	+ 20,358
Reading Corporation ..	,, 21	1,500	1,728	+ 228	20½	33,467	+ 6,058
Rotherham Corporation	,, 20	2,677	1,951	— 726	20½	44,857	— 1,214
Sheffield Corporation ..	,, 24	14,182	17,280	+ 3,098	21½	369,501	+ 76,229
Southampton Cor. ..	,, 20	2,940	2,897	— 43	20½	57,295	+ 4,050
Southend-on-Sea Cor. ..	,, 20	2,747	3,996	+ 1 249	21	49,325	+ 20,881
South Shields Cor. ..	,, 2	1,282	1,497	+ 214	18	24,834	+ 4,815
Sunderland Corporation ..	,, 24	2,263	3,197	+ 934	21	62,339	+ 17,583
Torquay Tramways ..	,, 14	1,700	2,019	+ 319	32	34,385	+ 6,037
Tyneside Trys. & Trmrds.	,, 13	1,323	1,458	+ 135	7	7,893	+ h 15
Wallasey Corporation ..	,, 23	2,470	3,068	+ 598	20½	56,271	+ 14,327
Walsall Corporation ..	,, 23	1,340	1,459	+ 119	21	29,881	+ 3,330
Walthamstow U.D. Coun.	,, 23	1,206	1,822	+ 616	21	37,785	+ 6,568
Warrington Corporation	,, 21	767	914	+ 147	20	18,096	+ 2,911
West Ham Corporation	,, 21	5,743	5,184	— 559	20½	112,341	+ 19,486
Wolverhampton	,, 27	1,661	2 055	+ 394	21	43.336	+ 5,872

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Wks.	Aggregate. 1918-19	Increase or Dec.
Anglo-Argentine	Aug. 18	£56 706	£60,410	33	£1,845,760	+ £18,425
Ballarat and Bendigo(4 wks)	June 22	3,076	3,261	12	10,815	+ 361
Brazilian Traction (Mirs.)	June	9,087,000	9,369,000	26	53,963,000	+ 4,270,000
Brisbane	July	36,360	41,610	20	262,155	+ 14,371
British Columbia .. $	June	488,873	411,605	52	7,062,599	+ 1,076,122
Buenos Aires Lacroze ..	July	41,145	45,222	4	45,222	+ 4,077
Burmah Tram. & Light Rs.	July 31	34,848	44,045	52	450,448	+ 115,668
Calcutta .. .. Rs.	Aug. 23	79,930	86,392	33½	..	+ 377,046
Carthagena and Herrerias	July	5,491	4,183	30	20,974	— 12,149
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	July	1,968	2,687	52	24,659	+ 6,760
Hong Kong .. .. $	July 12	15,662	15,733	28	404,681	+ 26,270
Kalgoorlie	April	2,876	2,907	18	10,400	— 71
La Plata	July	6,721	5,317	31	32,774	+ 2,840
Lima	June	42,161	47,811	26	282,907	+ 26,682
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras Rs	Aug. 18	42,117	46,273	32	598 757	— 11,186
Manila .. .. $	June	183,250	160,670	26	1,207,412	+ 170.313
Montevideo	July	31,684	34,139	39	334,076	+ 33,551
Para	July	24,398	24,659	34	196,736	+ 2,802
Pernambuco	Aug. 4	4,164	3,028	33½	171,361	+ 20,425
Peruvian .. .. $	July	987,300	1,058,730	..	..	..
Rangoon	July	6,054	6,762	30	45,188	+ 1,435
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore .. .. $	July 12	14,891	14,109	28	429,444	+ 30,934
Toronto .. .. $	June	1,035,932	842,697	26	6,138,296	— 222,873
Winnipeg .. .. $	June	293,140	112,615	26	1,874,640	+ 63,302

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THE
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THE
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SATURDAY, SEPTEMPER 6, 1919.

THE TRANSPORT ACT AND TRAMWAYS.

THE text of the Ministry of Transport Act, 1919, was issued on Wednesday, and it merits the close study of everyone concerned in public transport. Since the passing of the Merchant Shipping Act no legislative measure has affected so powerfully the business activity of the nation. Because clauses 3 and 5 specifically mention tramways, the attention of tramway committees, directors, managers and officials is likely to be concentrated upon these sections of the measure. But the implications of the Act are of course far larger. The primary aim and basic principle of the Act is the direction, control and development of transport service in the interests of the nation as a whole. It is merely foolish to say that municipal undertakings have been exempted from the direct control of the Minister of Transport because of political influence. The real reason and justification for that exemption is that municipally-owned tramways are practically national property, and are administered in the interests of the community. Clause 5 brings out this fact into strong relief. One of the defects of municipal tramway authorities has been a tendency to parochialism, a sedulous care for purely local interests at the expense of the convenience of the larger area. This clause provides that the "Minister shall have power to require through running on adjoining tramways belonging to different owners, whether local authorities or not." Everyone acquainted with recent tramway history knows the trouble which this provision has been framed to abolish. Where company and municipal tramway systems adjoin, through running powers, though obviously necessary to the convenience of the inhabitants of the district, have been difficult to negotiate. Even neighbouring local authorities have made the subject a cause of bickering and quarrel. Argument in favour of the exchange of through running powers between adjoining tramway systems is needless, for there is no rational argument against it. The whole difficulty arises partly from local prejudice and partly selfishness. The Act comes in with the strong hand of the Government, and commands that the interests of the nation shall be paramount, and that a just settlement of the question shall be made. Already the shadow of the coming Act has caused running agreements to be adjusted between municipal and company undertakings in one or two localities, the parties preferring voluntary action to the compulsion of the Minister. Clause 5, so far from being a derogatory interference with local authorities, is really a charter which confers upon them the status of units in a national service. The prospect revealed by this provision is vast beyond conception. Under the ægis of the Ministry of Transport, railways, light railways, tramways, and associated means of passenger transit may be developed into a complete national system, freed from the petty restrictions which have hitherto limited their activities, and aided by the broad views, vast powers, and financial resources of a Government Department which exists solely for that purpose. Hitherto all Government action in regard to tramways has been restrictive or grudgingly permissive; but the Ministry of Transport Act is liberating, directive, and compels to activity. The change is revolutionary, and its ultimate effects can hardly be estimated.

TRAMWAY WORKERS' DEMANDS.

EMPLOYERS DISCUSS QUESTION OF ARBITRATION.

Special conferences of the Municipal Tramways Association and the Tramways and Light Railways Companies were held at the Surveyors' Institution, London, on Thursday, to consider the proposal put forward by the National Transport Workers' Federation that the demands made by tramway workers all over the country should be submitted to arbitration.

The Federation have demanded an advance of 12s. a week for all tramway workers, the merging of war bonuses in permanent wages, and the reduction of the qualifying period for the maximum wage. The employers originally refused to negotiate on any of the demands except the qualifying period for the maximum, but the Transport Workers' Federation requested another joint conference, and this resulted in the arbitration offer being made.

The Executive Councils of the two Associations met in the morning, and in the afternoon there were full meetings of these bodies.

MUNICIPAL ASSOCIATION ASSENT TO ARBITRATION BY DISTRICTS.

Alderman James Bowes, of Manchester, presided at the meeting of the Municipal Tramways Association. It was a fully representative gathering, about 80 local authorities from all parts of the country being represented. After a free expression of opinion on the proposals submitted by the National Transport Workers' Federation, the following resolutions were passed unanimously :

(1) That in view of the present financial position of the tramway undertakings, no further increase of wages can be granted without either (*a*) raising the fares, or (*b*) increasing local rates to meet deficiencies.

(2) That the circumstances of different parts of the country vary greatly, and, therefore, it is impossible to deal with the whole matter in one arbitration.

(3) If arbitration is adopted, it must be in districts throughout the country, in accordance with the Wages Regulations Acts.

(4) That in view of these facts, we are prepared to accept arbitration through the Minister of Labour under the Wages (Temporary Regulations) Act, 1918, and the Extension Act of 1919.

A BURDEN ON THE COMMUNITY.

Mr. J. Beckett, the General Secretary of the Municipal Tramways Association, said it had transpired during their investigations that a number of the undertakings were already on the rates for subventions to meet the deficits that were being incurred. If anything else was added, it only meant further increases in local rate burdens. It was common knowledge in the North that any such burden would be put upon the backs of those sections of the industrial classes who were now receiving a lower rate of remuneration than the tramway employees, so that the position had been emphasised that the granting of the application would saddle a burden upon one part of the community to lift the wages of another part of the community.

COMPANIES REFER TO MINISTER OF LABOUR.

The Tramway and Light Railway Companies also held a meeting during the afternoon, at the conclusion of which it was announced that it had been decided to send the following letter to Mr. Robert Williams, Secretary of the National Transport Workers' Federation :—

Dear Sir,—I am directed to inform you that at a conference to-day of representatives of company-owned undertakings the report of the special committee appointed to meet your representatives regarding the application dated 5th July for (*inter alia*) further

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increase of wages was considered. The Committee reported that they had intimated to you that the company employers were unable to accede to your application, but that, as an outcome of the discussion, it was suggested that the matter should be referred to arbitration.

The conference, after considering the report of the Committee, desire to take this opportunity of supplementing the statement put forward at the recent meeting with yourselves regarding the extraordinary difficulties of the situation. In consequence of various awards and agreements very substantial increases in wages have been conceded, which, in the view of the conference, have kept pace with the gradual rises in cost of living, and tramway men are now in receipt of a wage which bears a proper relation to that of employees in other industries. The cost of operating tramways has increased enormously. It is true that revenue has also increased, but not in like ratio, with the result that on many company-owned tramway undertakings ordinary working expenses, including deferred maintenance, are in excess of revenue. The position, therefore, is that the companies cannot increase their wage bill without disastrous consequences. The advances which have already taken place, coupled with the extra cost of every commodity necessary for the running of a tramway, are such that many of the company-owned undertakings are faced with the prospect of insolvency.

Experience has clearly shown that unless net revenue is considerably augmented, many company-owned undertakings cannot continue to operate. Additional revenue can only be obtained from the passengers, and as tramway undertakings are unable, due to statutory and economic limitations, to increase fare rates indefinitely, their position is extraordinarily difficult.

Having regard, therefore, to the above circumstances, the conference is of opinion that the company employers are not in a position under present circumstances to entertain any proposal which involves increased expenditure. As you have already taken the necessary steps to bring the difference that exists between us before the Minister of Labour under the provisions of the Wages (Temporary Regulations) Acts, 1918-1919, under which the Minister of Labour has powers to refer such differences to arbitration by districts, we assume that we shall be hearing further from the Minister of Labour in due course.—Yours faithfully,

(Signed) A. DE TURCKHEIM,
Secretary.

EMPLOYEES' APPEAL TO LABOUR MINISTRY.

The replies, and also one from an Association representing four London 'bus companies, were considered at a conference of Unions representing bus and tramway workers at the offices of the Transport Workers' Federation on Thursday night. Mr. Robert Williams, the Secretary of the Federation, at its conclusion, said that the letters amounted to a refusal of the application for an increase in wages, and suggested arbitration by district, to which his Union was flatly and irrevocably opposed. They intended to send a deputation to the Ministry of Labour on Friday to indicate that in no possible circumstances would they accede to the principle of arbitration by district, and it was hoped that the Minister would use the powers conferred upon him to avert what must inevitably arise—a national strike—if the policy of the three employers' Associations were adhered to.

A further conference will take place to hear the result of the deputation.

It should be clearly understood that arbitration in districts is the only form of arbitration that is provided under the Wages (Temporary Regulations) Acts, 1918-19. The Municipal Tramway Association is therefore merely accepting the natural consequence of the appeal of Mr. Williams to the Ministry of Labour. The Federation should have consequently no possible objection to the form of arbitration in districts, which is in no way the suggestion of the Association.

OVERTURNED L.C.C. TRAMCAR.

EVIDENCE AT RESUMED INQUEST.

The inquest on the two men killed by the overturning of a tramcar near St. Pancras Station, on August 16, was resumed on August 28. Two questions appear to be involved: First, was the speed of the car excessive? Second, did the brakes fail to act? Evidence given by passengers in regard to the speed of the car was contradictory. One man said: "I do not think the speed of the car was unusual." A woman witness, on the other hand, said she heard her friend beside her on the car say, "We are going fast," but could not say exactly where the car was when her friend made the remark. Another witness, John Pearce, stated that he had pointed out to the police the spot at which he saw the driver of the car apply the brakes. Police evidence showed that the spot indicated by the witness was 23½ yards from the compulsory stopping place, and that from the stopping place to the scene of the accident was 14 yards. Ernest Ring, another passenger, said he was sure the car came to a stand still at every stopping place. At the stopping place before the scene of the accident, the car was started all right, but soon after it "started on its own," and ran at excessive speed. The inquiry was adjourned till September 13.

Stoppage on the London United Tramways.—While a car of the London United Tramways was passing through Brentford on August 30, a guard wire broke, and falling on the trolley wire, made contact with the car. The trolley wire then fused, and this resulted in a temporary stoppage of traffic.

RAILLESS TRACTION SCHEMES FOR NEWPORT.

Mr. A. Nichols Moore, Borough electrical and tramways engineer of Newport, has presented a report to the Electricity and Tramways Committee on the introduction of railless traction on certain routes in the district. The first suggestion dealt with is a proposed railless service between the tramway terminus in Corporation Road and the Channel Dry Docks, as suggested by Councillor Peter Wright, and the second for a line between Caerleon Road and Chepstow Road, providing a circular route, as proposed by Councillor W. E. Robertson. The length of the former would be approximately one mile, and the construction would involve the erection of two overhead trolley lines, together with feeder cable extensions for providing the supply, at an approximate cost of £3,000. Six cars would be required at an estimated cost of £12,000. As regards maintenance, Mr. Moore says that while railless traction compares favourably with ordinary motor omnibuses, the maintenance charges are higher than for a tramway service. The six cars would provide accommodation for approximately 240 passengers, but this is only one half of the estimated traffic that would have to be dealt with between Corporation Road and the Channel Dry Docks.

The total length of the route involved in the second proposal is one and a half miles, and the estimated cost of the overhead equipment £4,300. Cable extensions will be necessary, and the estimated cost of these is £2,700, which will be increased by another £2,000 if it be found necessary to provide a negative return feeder cable. A fifteen minutes' service is suggested, and this would require three cars, with one as a spare. The estimated cost of these vehicles is £6,000. There are some exceptionally steep gradients on the route, and the engineer considers it is by no means a good route for railless traction. Estimates for the overhead work, which do not provide for engineers' contingencies or for additional car shed accommodation, are based on side-pole construction with four trolley wires.

After a discussion, the Tramway Committee decided that the only practical solution to the question of the suggested service from Corporation Road to the Channel Dry Docks was to place the scheme before Messrs. Mawdey, Carney and Co. and the Channel Dry Docks Co., and to ask for suggestions and some idea as to what their contribution towards the cost of such an undertaking would be.

PROPOSED PURCHASE OF GREENOCK TRAMWAYS.

The purchase of the Greenock and Port Glasgow tramways was considered at a special meeting of Greenock Corporation on September 1, and after a long discussion it was decided to postpone a decision on the question until an inquiry had been made by the Tramways Committee. Provost M'Millan explained that some months ago Mr. W. L. Madgen, chairman of the company, had placed before the Tramways Committee a proposal of the tramways company that Greenock as an individual body, or in conjunction with the towns of Gourock and Port Glasgow should; purchase the undertaking at a price fixed by the Act of Parliament at the break in the lease in 1921. The Corporation would not be required to find cash so far as the Greenock portion of the line was concerned, as the tramway company were prepared to accept stock or mortgage at a reasonable rate of interest, say half per cent. above what the Government would pay. It was thought advisable to get further information, and the Provost moved that the matter be remitted to the Tramways Committee, who might call in expert advice if thought desirable, and consult Gourock and Port Glasgow, and also find out if there was a better method of transport than tramways. The Provost's motion was eventually adopted by 15 votes to 2.

COMMITTEE ON LONDON TRANSPORT.

Sir Eric Geddes, the Minister of Transport, has addressed a letter to the chairmen of the County Councils of London, Middlesex, Kent, Surrey, Essex, and Hertford, asking each Council to appoint a nominee to an advisory committee to be set up under the Transport Act. The committee is not intended to interfere with the proposal of the Parliamentary Committee on London Transport that a separate traffic authority be appointed to deal with the whole subject of London transport. As matters stand at present, the powers of the Transport Ministry are circumscribed. The situation is, in fact, rather complicated, and indicates some of the practical problems which the Ministry will be called upon to solve. Municipal tramway undertakings are expressly excluded from the control of the Ministry by the Transport Act, but the measure gives power to acquire possession of company tramway and light railway enterprises, and confers authority on the Ministry to compel adjoining tramway systems to exchange running powers. That is to say, for instance, the Ministry may take over the London United Electric Tramways, but must leave the London County Council tramways alone, excepting that it may compel inter-running on the two systems. The question whether or not an effort should be made to simplify the situation by obtaining further powers for the Ministry, is one for the proposed advisory committee to consider.

No Season Tickets on L.C.C. Tramcars.—For some time an agitation has been going on, urging the London County Council to institute a system of season tickets on the tramways. At a recent meeting of the Council, Mr. A. L. C. Fell, general manager of the tramways, pointed out that, as the conductors could only ask to see the covers of season tickets, the system would lend itself to wholesale fraud. It was agreed that no season tickets be issued.

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MISCELLANEOUS NEWS AND NOTES.

Willesden Council has applied for sanction for a loan of £18,489 for the purchase of fourteen electric vehicles.

Failed to Notice the Constable.—At Derby Police Court, a van driver was fined 20s. for failing to comply with the signal of the constable on point duty, and running into and damaging a tramcar.

London Cars for Walthamstow.—Walthamstow Council propose to purchase eight bogie cars from the London United Tramways Company at £570 each.

All Workmen.—Darwen Tramways Committee have decided that all who travel on the tramway cars between 6 and 8 a.m. and 5 and 6 p.m. are to be allowed to purchase workmen's tickets.

Soldiers to be Trained for Tramcar Driving.—Among the educational projects of the War Office is a proposal to institute classes for training soldiers to become skilled tramcar drivers.

Fares at Burnley.—In spite of advances in wages and other costs, the Tramways Committee of Burnley have decided not to make any increases in fares at present. If, however, any further advance in wages is granted, an increase in fares will become inevitable.

Cairo Tramway Strike.—A Reuter's message of September 2 reports that the tramway strike was settled at midnight, the men resuming work on the conditions laid down by the Conciliation Board. Services were expected to start on September 3.

No Workmen's Single Fares.—The Stalybridge, Hyde, etc., Joint Tramways Committee, owing to the increased cost of coal and shorter hours of labour, have decided to discontinue single fare workmen's tickets.

Coal Transport Reorganisation.—The restrictions on the transport of coal by rail under the coal transport reorganisation scheme were suspended as from September 1. A general permit has been issued, and it will not be necessary until further notice to apply for permits in individual cases.

Amiens Tramway Services Suspended.—Owing to the shortage of coal so general on the Continent, it has been found impossible to keep the electric generating station at Amiens at work. On August 31, the tramway services were suspended and the lighting circuits of the town interrupted.

Technical Supplement.—The Bureau of the Federation of British Industries states that the "Technical Supplement," which as recently announced was to be discontinued officially, is to be published by private arrangement. Communications should be addressed to the *Technical Review*, 20, Tavistock Street, London, W.C.2.

Sunderland Exchanges Running Powers.—After long delay and a considerable amount of agitation locally, Sunderland Corporation Tramways Committee have decided to recommend the Town Council to adopt the principle of running powers in connection with the District Tramways Company.

Increase in Montreal Fares.—Fares on the Montreal tramways have been increased from 3d. to 3½d. Strips of tickets of four, instead of five as previously, are sold for 25 cents (1s. 2d.) during normal hours. The increase in fares has apparently been determined upon in order to provide for an increase of wages.

Increased Fares at Walsall.—Walsall Corporation on Monday will put into force an increase of tramway and omnibus fares. This is the first increase that has taken place since the Corporation took over the tramways, and the addition is a considerable one, amounting to about 50 per cent. Fare stages have been much shortened.

Strike on Marseilles Tramways.—The Tramway Employees' Union at Marseilles having declared its sympathy with the dockers who have been on strike for the past week, refused to carry the French colonial labourers who had been placed at the disposal of the port authorities by the Government. Accordingly they were unable to proceed with the work.

Dover Tramway Accident.—The compensation expenses in connection with the accident that occurred on the Dover Corporation tramways on August 12, 1917, owing to the overturning of a car, which resulted in the death of eleven persons and injury to sixty-one others, are reported at £14,575. A special rate of 1s. 6d. in the £ will be required, in addition to the £1,000 insurance received.

Dublin Tramway Extensions Foreshadowed.—The Dublin Corporation, after discussing the loan offered by the Development Company of Ireland for housing purposes, resolve to ask the company to place £1,000,000 to the credit of the Corporation at once, in order that the housing plans already decided upon may be undertaken forthwith. The total sum required for housing in Dublin is stated to be £12,000,000, and this sum will be raised by the loan in question later on.

Golcar Demands a Tramway or Omnibus Service.—Golcar District Council are urging the Huddersfield Corporation to extend their tramway system to Golcar, and the Council of the latter have been asked whether they would be agreeable to appoint a small sub-committee to meet the Council's Executive Committee to discuss the question of a tramway or a motor omnibus service. The suggestion has been agreed to, and a joint committee will discuss the matter.

Whitley Council for the Tramway Industry.—The first meeting of the Joint Industrial Council for the Tramway Industry, which has been in course of formation for over a year, was held at the Ministry of Labour on September 5. The Council includes representatives of the Municipal Tramways Association, the Tramways and Light Railways Association, and the employees. The preliminary draft of the constitution was given in THE TRAMWAY AND RAILWAY WORLD of June 19, 1919. The proceedings of the first meeting were formal.

A Singular Accident.—The circumstances of the death of a boy in Vauxhall Road were the object of enquiry at the Coroner's Court, Lambeth, last Friday. The mother of the boy stated that a tramcar which they were boarding moved and threw the child over the end of the car and under a railway van. Both the conductor and the driver of the car said that it was stationary at the time, the conductor explaining that the boy knocked his chest against the car rail and fell back under the van. The coroner accepted the story of the officials, and exonerated them from all blame.

Wages of Irish Transport Workers.—The Union of Transport Workers in Ireland are demanding increases in wages and reduction of hours of labour. At a meeting of South Wexford Districts Committee, held at Lady's Island, representatives of five branches discussed the results of a conference with the executive of the Farmers' Union. The agreement arranged was ratified. The District Wages Board about to be set up at Arklow was also discussed, and questions raised as to the constitution of the Board referred to the executive of the Transport Union.

Strike at Grimsby.—About 2,000 transport workers came out on strike at Grimsby on August 29. The principal cause of the dispute is that the men employed by the Great Central Railway at Immingham do not get the same privileges as the employees of the stevedores, who receive 1s. for travelling time and full tramway fares daily. Captain Barwick, the port master, says that the strike has been caused by the impatience of the local transport workers, a settlement having been practically ready for ratification on the day the men came out.

American Electrical Plant for Cape Town.—A Press message from Cape Town dated August 30 states that the City Council have reluctantly decided to place an order with the General Electric Company, of America, for new electrical plant to the value of £28,278. Several British tenders were received, and the difference in price was not considered material. British tenderers were however, unable to offer an early delivery, and as the plant is urgently required to avert a threatened breakdown of the electric system, the Council felt compelled to accept the American offer.

American Tramway Exhibition.—An exhibition of electric railway appliances will be held in connection with the convention of the American Electric Railway Association, which meets in Atlantic City from October 6 to 10. As the exhibition has been omitted for several years, manufacturers and others are taking much interest in the forthcoming meeting, and are planning attractive exhibits. It is reported that a large portion of the available space has already been allotted, and it is expected that many interesting novelties will be shown.

Tramway and Omnibus Proposals at Wallasey.—Wallasey Town Council is shortly to consider the draft of a comprehensive Bill to be promoted in Parliament. Among the powers to be sought are provisions for new tramways, widening thoroughfares through which the lines run, and the provision of motor omnibus services upon various routes both within and without the borough, at a maximum charge of 1½d. per mile run by both tramway cars and motor omnibuses; the Corporation to have power compulsorily to purchase within a period of three years such land as they may require for road widening.

Wages at Liverpool.—The recent strike at Liverpool arising out of the demand for 60 hours' pay for 48 hours' work was temporarily settled on the understanding that negotiations would be opened between the men's leaders and the Tramways Committee. A deputation from the tramwaymen's union was received by the Liverpool Corporation Tramways Committee on August 28, when the demand was reiterated by the representatives of the men. At the request of the Committee a decision was adjourned pending the decision of the Co-ordination Committee of the Corporation on a similar application for all servants of the Corporation.

Whitley Council for Electrical Industry.—Ashton-under-Lyne Generating Station Committee have approved the formation of a Whitley Joint Council for workers in the electricity department only. It embraces Lancashire, North Wales, Cumberland, and Westmorland. By the establishment of this Council it is hoped to obtain uniform action throughout the whole of these districts. The General Purposes Committee of Ashton-under-Lyne have resolved that a representative of the joint board with a representative of Ashton Corporation should seek an interview with the Chief Electrical Commissioner with regard to the setting up of a joint electrical authority for this area.

Saved from Bankruptcy.—A large number of American tramway companies are obtaining authority from the local State Legislatures and other governing bodies to increase their fares. Owing to present conditions the 2½d. universal fare has in many cases become impracticable, and many of the companies are faced with serious financial difficulties. Among the undertakings recently given a concession on this account is the Kansas City Railways. For one year from August 20 they are authorised to charge a fare of 8 cents (just over 4d.), but two tickets will be sold for 15 cents, seven for 50 cents, and fifty tickets for $3.50. Although the State Railway Commission has authorised the increase, the city officials will oppose the advance, although it is unlikely that the opposition will meet with success. The Commission estimate that the increased fares will enable the company to earn 4.8 per cent. per annum for depreciation and interest on the bare value of the property. The order allowing the increase in fares also requires the company to increase the service by one hundred cars. The Commission found that "immediate relief is necessary to save the company from bankruptcy."

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CONTRACTS AND ORDERS.

Vickers, Ltd., have an order from Ayr Corporation for a rotary converter at £2,119.

The English Electric Company; Ltd., are building three new electric cars for Darwen Town Council.

The Glasgow Numerical Printing Company, Ltd., have an order for the supply of tickets for three months from Glasgow Corporation tramways.

Wallasey Tramways Committee have recommended the acceptance of a tender for the supply of six motor omnibuses at £1,515 each. The routes inside and outside the borough on which they will be used are under consideration.

New Cars for Belfast.—The Belfast Tramways Committee has recommended the acceptance of the tender of the English Electric Company, Ltd., of Queen's House, Kingsway, London, W.C., for the equipment of fifty cars, at £31,770. The order for the car bodies and trucks was recently placed with the Brush Electrical Engineering Company, Ltd., of Loughborough.

PERSONAL.

Mr. G. A. Newsome, manager of Darwen Corporation tramways, has been granted an increase in salary to £350.

Sir William H. Clarke, K.C.S.I., C.M.G., Controller-General of the Department of Overseas Trade, has resumed his duties after a prolonged absence owing to ill-health.

Alderman James Bowes, for eleven years chairman of the Manchester Tramways Committee, in celebration of the seventieth anniversary of his birth, has received a gift from his colleagues.

Sir William Mitchell Thomson, M.P., and **Lieut.-Colonel the Hon. Arthur Murray,** D.S.O., M.P., have been appointed directors of the North British Railway Company.

Mr. Evans, traffic superintendent of the Newport Corporation tramways, has been granted an increase in salary to £312 per annum, by the unanimous vote of the Committee, as some recognition of the splendid work he has done.

Messrs. C. P. Sandberg intimate that their London address is now 40, Grosvenor Gardens, London, S.W.1. The cable and telegraphic address will remain as before, but the telephone numbers are Victoria 6877, 6878 and 6879.

Mr. A. Anderson, general manager of the Oldham, Ashton and Hyde Electric Tramway Company, has left Denton and taken up a similar post under the British Electric Traction Company at Peterborough.

Professor Joseph Ernest Petaval, D.Sc., F.R.S., M.I.Mech.E., has been appointed Director of the National Physical Laboratory in succession to Sir Richard Glazebrook, C.B., F.R.S., who retires on reaching the age limit on September 18. Professor Peteval is Professor of Engineering and Director of the Whitworth Laboratory in the University of Manchester.

Mr. C. W. Mallins, general manager of the Liverpool Corporation tramways, recently tendered his resignation to the Tramways Committee. For reasons of health he felt compelled to ask the Committee to release him from the position which he had held for the past fifteen years. At a special meeting of the Committee held last week it was unanimously resolved to request Mr. Mallins to withdraw his resignation for the present and to accept three months' leave of absence, in order to take a complete rest.

FINANCIAL.

Brasilian Traction Light and Power.—A quarterly dividend of 1½ per cent. has been declared on the fully-paid cumulative preference shares.

Bolokow, Vaughan and Co.—The directors have decided to pay a further dividend on the ordinary shares for the year ended June 30th last of 8 per cent., less income tax, in addition to the interim dividend paid in March last.

Kalgoorlie Electric Tramways.—After providing for interest and sinking fund on the "A" debenture stock and charging interest (not paid) on the "B" debenture stock, the accounts for 1918 show that the debit balance of £30,519 brought down was further increased to £36,519 (this debit balance of £36,519 was arrived at after charging interest to date on the "B" debenture stock, which was in arrear as at December 31, 1918, to the extent of £40,500).

L.C.C. Traffic Receipts.—The traffic receipts for the week ended September 3 amounted to £79,659, an increase of £11,114 as compared with the corresponding period last year. The route mileage was 141.67, the same as a year ago. From April 1 (the commencement of the financial year) to September 3 (twenty-two weeks and two days) the total receipts were £1,811,091, an increase of £367,237 in the corresponding period of 1918.

Central London Railway Extension.—The line between Ealing and Shepherd's Bush, which has been constructed by the Great Western Railway Company, and is essentially an extension of the Central London Railway from Wood Lane station, will be opened on October 1. It was originally intended to run electric trains on the extension, but at present the service will be provided by steam trains. It was found impossible to obtain the necessary electrical equipment owing to the shortage of material, but as soon as practicable the line will be electrified. At the outset there will be a fifteen minutes' service during the morning and evening, and it is hoped that this will improve the existing overcrowding on the trains from Ealing to the City.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1918.	Incr. or Dec.
Aberdare U.D.C.	Aug. 26	542	573	+ 31	21	11,567	+ 675
Aberdeen Corporation	,, 27	2,889	3,413	+ 524	12½	44,845	+ 9,760
Ayr Corporation	,, 30	804	941	+ 137	15	14,318	+ 2,019
Belfast City	,, 29	8,471	10,178	+ 1,707	22	228,509	+ 54,514
Birkenhead Corporation	,, 31	2,297	3,039	+ 742	21½	62,167	+ 15,403
Birmingham Corporation	,, 23	24,305	25,548	+ 1,243	21	526,059	+ 47,631
do. Motor Buses	,, 23	1,752	1,787	+ 35	21	37,170	+ 4,420
Blackburn Corporation	,, 27	1,862	2,320	+ 458	22½	53,148	+ 11,284
Bradford Corporation	,, 30	9,676	10,977	+ 1,301	23	252,222	+ 49,741
Burnley Corporation	,, 30	2,326	3,049	+ 723	..	..	..
Burton-on-Trent Cor.	,, 31	426	545	+ 119	22	11,023	+ 1,873
Bury Corporation	,, 31	2,060	2,310	+ 250	20½	53,066	+ 7,250
Chatham & District	,, 21	1,621	1,835	+ 214	33	50,258	+ 6,902
Cork Electric	,, 14	704	856	+ 152	32	21,063	+ 671
Derby Corporation	,, 30	1,538	2,079	+ 541	22	42,535	+ 8,850
Dundee City	,, 27	2,061	2,692	+ 631	14½	38,697	+ 9,296
East Ham Corporation	,, 30	1,602	1,811	+ 209	21½	42,015	+ 8,495
Edinburgh	,, 28	9402	10,884	+ 1,482	7½	96,689	+ 19,216
Glasgow Corporation	,, 30	28,974	32,067	+ 3,093	13	414,073	+ 42,279
Glossop (U.E. Sup. Co.)	,, 30	179	229	+ 50	35	7,766	+ 1,344
Huddersfield Corporation	,, 30	4,077	4,902	+ 825	22	108,764	+ 23,676
Ilford U.D. Council	,, 30	1,026	1,254	+ 228	21½	26,501	+ 4,515
Ipswich Corporation	,, 30	935	1,069	+ 134	21	21,145	+ 3,408
Isle of Thanet	,, 27	871	2,721	+ 1,850	47½	40,223	+ 26,686
Kilmarnock Corporation	,, 30	274	294	+ 20	15½	4,489	+ 586
Lanarkshire	,, 21	3,847	4,235	+ 388	33	117,751	— 1,025
Leeds City	,, 30	13,925	16,028	+ 2,102	22	369,410	+ 81,307
Leicester Corporation	,, 30	4,642	6,110	+ 1,468	..	..	..
Leyton U.D Council	,, 28	2,405	2,897	+ 592	22	69,886	+ 19,770
Liverpool Corporation	,, 30	19,061	23,060	+ 3,999	34½	750,193	+ 127,852
London County Council	Sept. 3	68,545	79,659	+ 11,114	22½	1,811,091	+ 367,237
Maidstone Corporation	Aug. 28	306	410	+ 104	21½	8,570	+ 2,229
Manchester Corporation	,, 30	26,829	29. 91	+ 3,162	22	670,688	+ 111,267
Newcastle-on-Tyne Cor.	,, 23	9,696	9.315	— 381	21	200,875	+ 19,614
Northampton Cor.	,, 22	857	1,352	+ 495	20	27,207	+ 8,720
Nottingham Corporation	,, 28	5.731	7,304	+ 1,573	22	156,943	+ 28,055
Oldham Corporation	,, 31	3,542	4,041	+ 499	23	102.136	+ 20,857
Reading Corporation	,, 28	1,435	1,184	+ 249	21½	35,152	+ 6,307
Rotherham Corporation	,, 27	1.6:9	1,042	— 587	20½	46,899	— 1,801
Sheffield Corporation	,, 31	13,439	16,675	+ 3,245	22½	386,476	+ 79,474
Southampton Cor.	,, 27	2.839	2,901	+ 62	21½	60,197	+ 4,112
Southend-on-Sea Cor.	,, 20	2,747	3,996	+ 1 249	21	49,325	+ 20,881
South Shields Cor.	,, 2	1,282	1,497	+ 214	18	24,834	+ 4,315
Sunderland Corporation	,, 21	2.077	3,012	+ 935	22	65,352	+ 18,469
Torquay Tramways	,, 14	1 710	2,019	+ 319	32	34,385	+ 6,037
Tyneside Trys. & Trmrds.	,, 13	1,323	1,458	+ 135	7	7,893	+ 15
Wallasey Corporation	,, 30	2,071	2,710	+ 639	21½	58,981	+ 14,975
Walsall Corporation	,, 30	1,229	1,389	+ 160	22	30,770	+ 2,490
Walthamstow U.D. Coun.	,, 30	1,402	1,685	+ 193	22	39,471	+ 6,742
Warrington Corporation	,, 28	766	904	+ 138	21	19,000	+ 2,949
West Ham Corporation	,, 28	4,705	5.075	+ 370	21½	117.416	+ 22,856
Wolverhampton	Sept. 3	1,610	1 999	+ 389	22	45 336	+ 6,267

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Aug. 26	£56,735	£62,019	34	£1,907,779	+ £23,709
Ballarat and Bendigo(4 wks)	June 22	3,076	3,261	12	10,818	+ 361
Brazilian Traction (Mlrs.)	July	9,465,000	10,070,000	30	64,033,000	+ 4,875,000
Brisbane	July	36,360	41,610	20	202,155	+ 14,871
British Columbia $	June	488,873	411,605	52	7,062,599	+ 1,076 122
Buenos Aires Lacroix	July	41,145	45,222	4	45,222	+ 4,077
Burmah Tram. & Light Rs.	July 31	34,848	44,045	52	450,448	+ 115,668
Calcutta Rs.	Aug. 23	79,930	86,392	33½	..	+ 377,016
Carthagena and Herrerias	Aug.	2,729	2,991	34	23,965	— 11,887
Cordoba	Feb.	12,972	13.549	48	159,208	+ 11,492
East India	July	1,988	2,687	52	24,689	+ 6,760
Hong Kong $	July 12	15,662	15,738	28	404,631	+ 26,370
Kalgoorlie	April	2.876	2,907	18	10,100	— 71
La Plata	July	6.721	5,317	31	32,774	+ 2.840
Lima	June	42.161	47,811	26	282,907	+ 26,682
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras Rs.	Aug. 15	42,117	46,273	32	598,757	— 11,186
Manila $	June	183,250	160,670	26	1,207,412	+ 170.313
Montevideo	July	31,684	34,139	39	334,076	+ 33 552
Para	July	24,398	24,659	34	196,736	+ 2,102
Pernambuco	Aug. 31	4,209	5,047	34½	175,409	+ 21,263
Peruvian $	July	987,300	1,058,780	..	..	..
Rangoon	July	6,054	6,762	30	45,188	+ 1,435
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore $	July 26	14,631	14,595	30	458,681	+ 50,458
Toronto $	June	1,035,932	842,697	26	6,132,296	— 222,873
Winnipeg $	June	203,140	112,615	26	1,874,640	+ 63,302

CARS, MOTORS, CONTROLLERS.
(DICK, KERR SYSTEM.)
THE
ENGLISH ELECTRIC COMPANY LIMITED,
Queen's House, Kingsway,
LONDON, W.C.2.

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THE Tramway & Railway World
WITH MOTOR TRAFFIC SECTION

Founded 1892. LONDON, SEPTEMBER 11, 1919. VOL. XLVI.

DUNDEE MUNICIPAL TRAMWAYS.

A PROGRESSIVE SYSTEM WITH PROSPECTS OF EXTENSIVE DEVELOPMENT.

Dundee, where the Municipal Tramways Association is holding its annual conference this month, is an ancient city teeming with historical associations of stirring interest, containing numerous buildings of architectural merit set amidst scenes of rare natural beauty. Passengers on any of the tramway routes, no matter how practical the purpose of their travel, will see much to awaken curiosity and inquiry. The Perth Road section, for example, is rich in historical association, and it runs out into the country near to the quaint village of Invergowrie. The cars start from the space in front of the Town House, and pass through Nethergate and past Whitehall Street on the left, in which is the Gilfillan Memorial Hall and Church; on the same side is Union Street leading to the Caledonian Railway and Tay Bridge Station, the Tay ferries and the Esplanade. Running still westward the cars pass Dundee University College and on to the terminus at Ninewells. From this part of the route the passenger has a view of the Tay Bridge, the wide reaches of the river and undulating expanses of inland country. Seagate and Ferry Road section is not less interesting. By this route cars run through Broughty Ferry to Monifieth on the line of the Dundee, Broughty Ferry and District Tramway Company. To do justice to the historic and scenic features of the Corporation's tramway routes would involve the compilation of a guide book, and that is beyond the province of this article. There are few tramway systems that offer more points of interest, and the tramways are largely used for purposes of recreation and pleasure.

The Centre of the Dundee Corporation Tramway System.

Considering that the population in the district embraced by the Corporation tramway system is only 166,000, the figures with reference to traffic in the table given at the end of this article show that the service is fully appreciated by the public. The Corporation has invested in the undertaking a capital of £384,788. Of this amount, loans to the extent of £128,569 have been repaid. Expenditure on track alone has amounted to £264,415. With a total traffic revenue of £105,933 and

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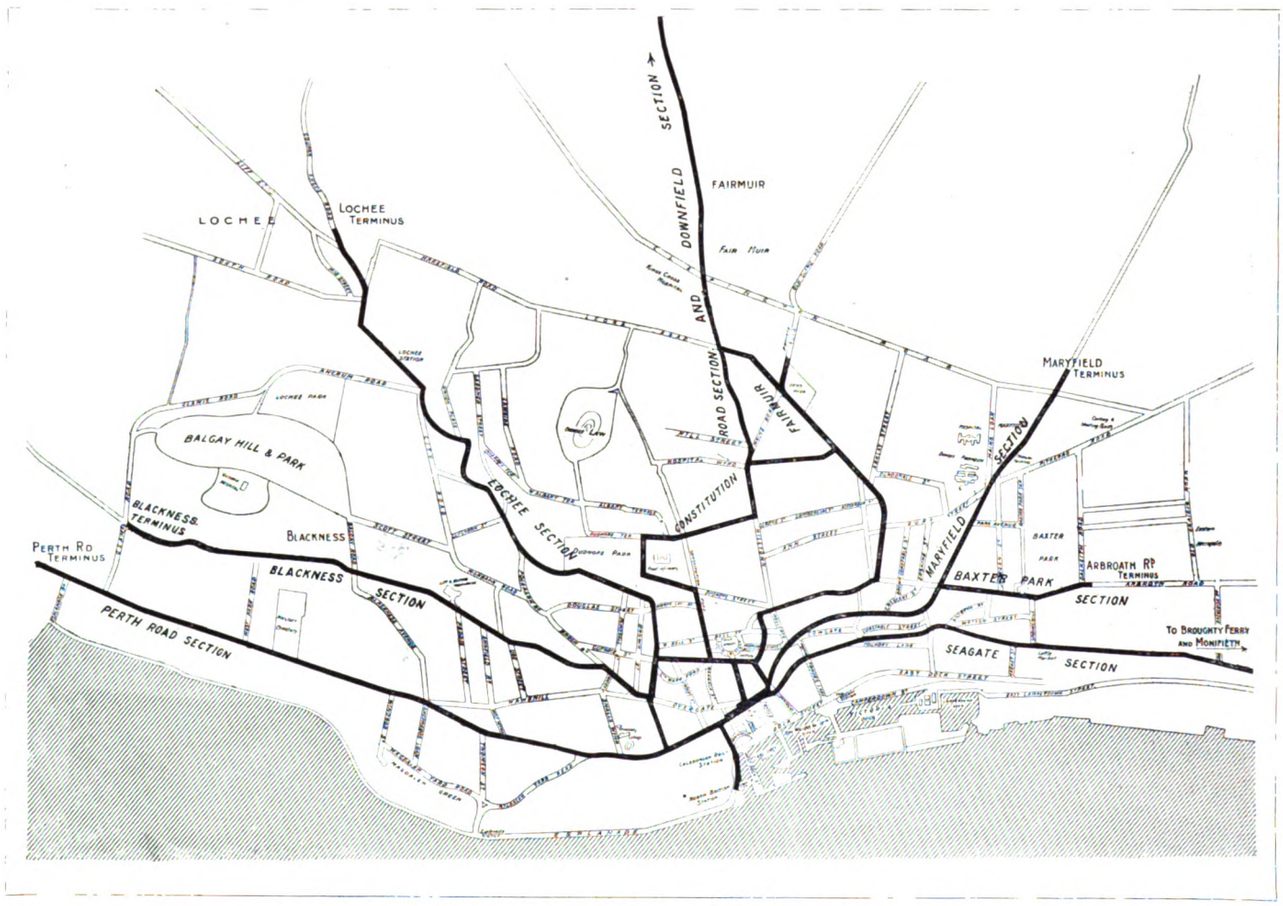
working expenses 72 per cent. of the revenue, the Dundee tramway management can hardly be said to enjoy a large margin, but thanks to the reduction by the sinking fund the annual interest charge now amounts to only £12,000.

Like most British tramway undertakings, the tramways of Dundee have a rather complex early history. Though far north of the Forth, the city was as strongly affected by the movement toward tramway enterprise as any city of the south, and soon after the passing of the Tramways Act of 1870 various schemes were suggested. About the beginning of 1872 a group of London financiers interested in tramway promotion, at the invitation of a few Dundee men, drew up plans for a tramway system, but the scheme was not sufficiently supported locally, and it was left to municipal enterprise to provide the public with facilities that were bring the system up to date by electrification. Perth Road section was the first to be dealt with, and electric cars began to run on July 13, 1900. The electrification of the rest of the system was continuous, and considerable extensions were made in various directions. The year 1900 thus began an era of great activity for the Corporation tramways department, and the energy that planned and carried out the schemes of electrification and extensions has not abated. When the Corporation took over the undertaking, Mr. Peter Fisher was general manager and secretary of the Dundee and District Tramways Company, and he continued to serve the company through the negotiations which ended in the transfer of the undertaking to the Town Council. He was then asked to become general manager under the Corporation; he accepted the invitation and was thus afforded the opportunity



Map of Dundee Corporation Tramways.

so much required. The tramways in Dundee have, in fact, all been constructed by the Corporation, and have always remained the property of the city. The first line was built in 1877 along Perth Road, and if the Act of 1870 had not prevented it, the Corporation would probably have operated the lines themselves; for popular opinion seems to have been strongly against any engagement with outside financiers. As a compromise a company was formed by local men to take over the operation of the tramway. The Dundee and District Tramways Company thus came into existence, and it continued to work the original lines and the extensions that were subsequently made until 1899.

In the previous year the Corporation succeeded in obtaining Parliamentary powers to work the tramways and took over the undertaking on June 1, 1899. From that date the system made rapid progress. As soon as they assumed control, the Town Council decided to of realising his desire to provide Dundee with an efficient system of passenger transport.

Crowded as it is between hilly country and the Tay, with narrow streets densely populated, Dundee presented traffic problems of more than ordinary difficulty, but the Corporation and the general manager proceeded steadily with their task, and brought the system to such a condition that it well serves the requirements of the community. Defects there are, of course, but these are inherent in the peculiar situation and formation of the city. As will be seen from the map, the system consists of seven lines all radiating from High Street at the centre of the city to seven termini in the north, east and west, the lines in the two latter directions running parallel with the river front. All the lines terminate at dead ends, with the result that there is a certain amount of congestion in the thoroughfares and loss of time at the far-spread termini.

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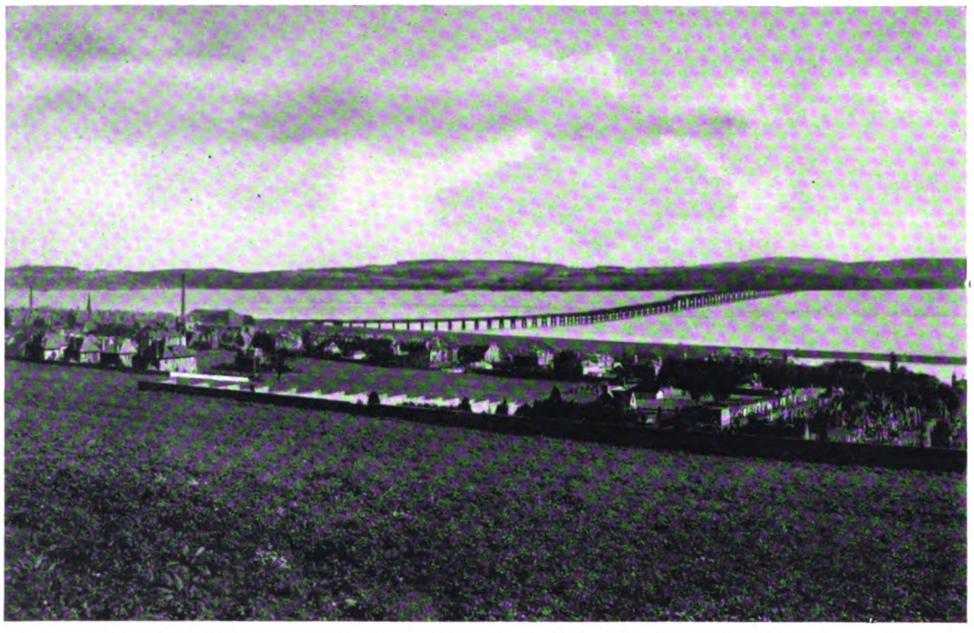
Many expedients have been tried to escape from the inconvenience that this arrangement involves, and there are plans, which were described in our issue of June 19 last, for the construction of an outer ring road, along which tramways would be constructed and conveniently connect the seven radial lines at their outer termini. One effort that was made to provide such connection deserves special mention. Mr. Fisher knew that connection of the dead ends by an encircling tramway track running right round the outer boundary of Dundee would solve the problem; but he was also aware that the Town Council could not sanction the expenditure that such a scheme would involve. He conceived the notion, however, that the railless trolley system, which had been successfully worked on the Continent, might be used as a connecting link between the dead ends of the tramway routes on the outskirts of the city. After much deliberation the Town Council appointed a special committee to investigate. This committee visited places abroad and inspected railless trolley systems there installed. On their return they reported favourably and powers were obtained to construct a railless section on a route connecting two important tramway lines to the north-east of Dundee. The overhead electric equipment was installed, and cars with under-running trolleys were obtained. On September 3, 1912, the line was inspected on behalf of the Board of Trade and the equipment approved. For some time a satisfactory service was given, but owing to the refusal of the road authorities to maintain the roads in proper condition, the service was subsequently withdrawn. It is only just to point out that the decision to discontinue the service was not caused by any defect in the railless system. The circumstances were exceptional, but the venture proved that under proper road conditions it would have been a conspicuous success.

The Town House—Market Day in High Street, Dundee.

An inspection of the map will show that the Dundee tramway system as it exists to-day comprises eight sections, all starting in the vicinity of High Street. The total street length is 16 miles 4 furlongs. Of this, 13 miles 4 furlongs are double track and 3 miles single track, giving a total track length of 30 miles. The maximum gradient is 1 in 10, and the sharpest curve is of 30 ft. radius. The gauge is 4 ft. 8½ in., and the track is laid with grooved girder rails on a 6 in. bed of concrete. On the greater part of the tracks the rails weigh 92 lbs. to 95 lbs. per yard, though on the more recent extensions rails of No. 4 B.S.S., weighing 104 lbs. per yard have been used. Recent extensions have Thermit welded joints, which have also been used where rails have been renewed, and lengths of old rails with gripper anchors are placed at 6 ft. centres. All repairs to hammered joints are carried out by the electric arc welding process.



The Tay Bridge seen from the Terminus of the Blackness Road Section.

The overhead equipment of the early sections was constructed by Robert W. Blackwell and Company, Limited. On the first sections the trolley wires were

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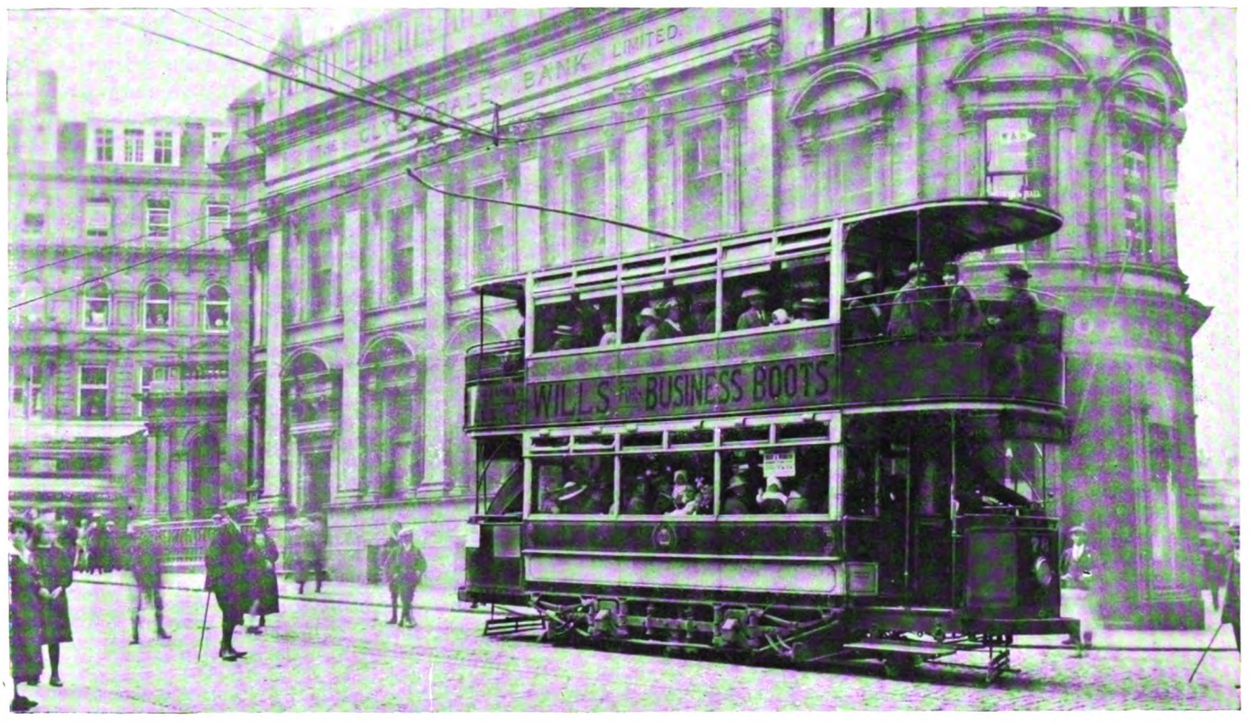
suspended from side poles with bracket arms, but later extensions have been constructed on the centre running principle, with span wires supported either from poles erected at the sides of the road or from rosettes which have been affixed to buildings where this was feasible.

types, and 24 are carried on bogie trucks of the Brill type. The seating capacities of the various types of cars range from 43 to 59. The electrical equipment, on all but four cars, is of the Dick-Kerr type throughout. The department also possesses two locomotives, a tower wagon and an electric track sweeper.

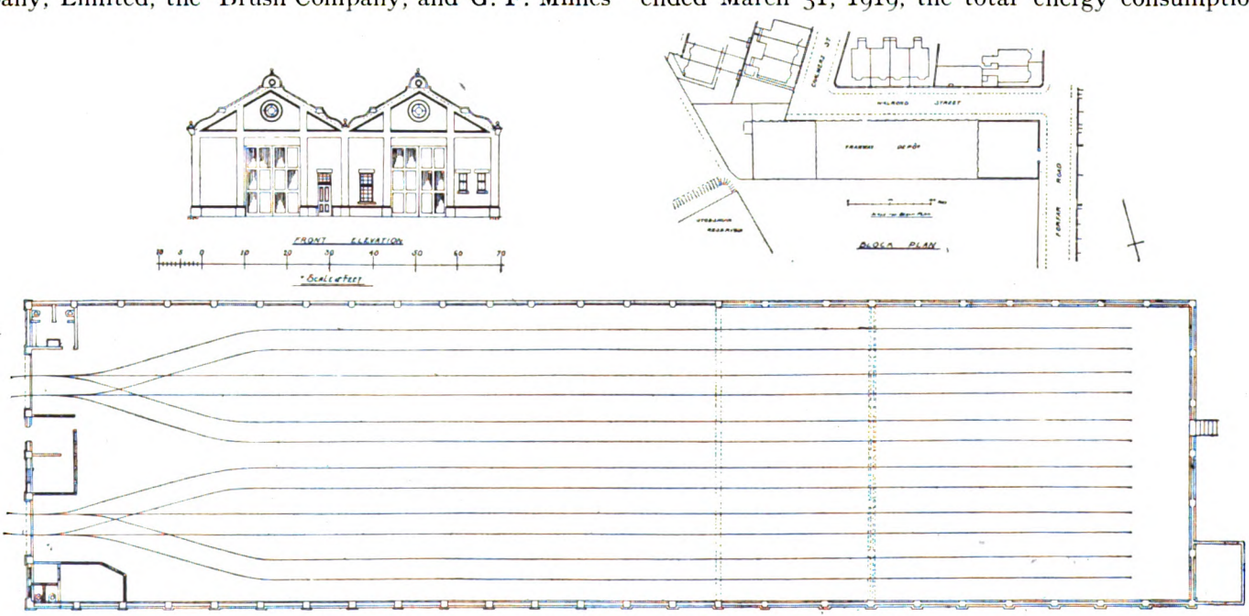


Standard Car—Dundee Corporation Tramways.

The passenger rolling stock consists at present of 76 cars, of which the greater number were supplied by Dick, Kerr and Company, Limited, the remainder having been obtained from Hurst, Nelson and Company, Limited, the Brush Company, and G. F. Milnes and Company, Limited. Fourteen cars are at present on order from Hurst, Nelson and Company, Limited. Of the cars at present in use 70 are of the double deck type with top covers, and six of the single deck type. Most of the cars are mounted on Brill trucks of various

Electric energy is obtained from the municipal lighting station, which has been equipped for the purpose, and the tramways department pay to the Electricity Committee 1⅓d. per unit. During the year ended March 31, 1919, the total energy consumption was 3,112,455 units, an average per car-mile of 2·11 units. Particulars of the power consumption for previous years are set out in the appended table.

An interesting feature of the Dundee system is the provision made for the comfort of waiting passengers.



Front Elevation and Plan of Mansfield Car Depot—Dundee.

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DUNDEE CITY TRAMWAYS—SUMMARY OF FINANCIAL RESULTS, 1910-1919.

Year	1910-11.	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
Lines open (single track) miles	Miles fur. 26 2	Miles fur. 27 3	Miles fur. 27 3	Miles fur. 28 2	Miles fur. 28 2	Miles fur. 30 0	Miles fur. 30 0	Miles fur. 30 0	Miles fur. 30 0
Total capital expenditure	£347,917	£349,854	£352,668	£362,116	£371,145	£383,486	£384,004	£383,737	£384,788
Loans repaid	£71,223	£77,173	£81,412	£90,063	£96,762	£103,642	£110,902	£110,902	£128,569
Renewals and reserve funds	£52,397	£60,984	£71,823	£82,966	£92,684	£97,894	£97,820	£104,872	£117,229
Total receipts	£62,913	£62,679	£65,044	£69,504	£68,273	£71,940	£76,347	£87,734	£105,933
Working expenses	£39,671	£39,283	£39,422	£43,438	£43,358	£48,431	£51,016	£60,363	£76,225
Average total receipts per car-mile	11·385d.	11·283d.	11·480d.	11·92d.	11·80d.	12·2d.	12·81d.	14·444d.	17·240d.
Percentage of operating expenses to total revenue	64·5	61·9	60·6	62·49	63·5	67·3	66·8	68·8	72
Energy consumption per car-mile (units)	1·739	1·764	1·803	1·815	1·847	1·912	2·006	2·070	2·110
Car mileage	1,326,225	1,335,512	1,359,821	1,387,980	1,388,345	1,415,887	1,430,120	1,458,384	1,474,666
Passengers carrie	17,295,727	17,022,580	17,734,162	19,042,344	18,753,140	19,626,640	20,063,506	22,831,531	24,939,279
Traffic revenue per mile of single track	£2,287	£2,222	£2,305	£2,387	£2,345	£2,348	£2,395	£2,725	£3,491
Average working expenses per car-mile (excluding power cost)	5·222d.	5·10d.	5·154d.	5·686d.	5·648d.	6·148d.	6·346d.	7·517d.	9·943d.
Average working expenses per car-mile (including power cost)	7·179d.	7·077d.	6·957d.	7·511d.	7·495d.	8·209d.	8·554d.	9·933d.	12·405d.
Average fare paid per passenger	·853d.	·861d.	·857d.	·853d.	·851d.	·861d.	·859d.	·861d.	1·001d.
Total number of units used	2,307,302	2,356,993	2,451,897	2,520,470	2,564,659	2,707,958	2,889,714	3,019,071	3,112,455

Shelters of attractive design have been placed at seven different stopping stations. Attached to most of the shelters is a shop in which newspapers, etc., are sold. The shopkeeper acts as keeper of the shelter in return for free occupation of the premises.

Like many other towns, Dundee is envisaging the future with intent to equal the demands that will be made on its means of communication as the city develops. As previously indicated, each of the seven radial tramway routes commences in an industrial area and terminates in a residential district, at or near undeveloped land, and thus the necessity presents itself for a well-considered scheme making provision for transit facilities for all the outskirts. Such a scheme has been drawn up by the city engineer, Mr. James Thomson. A summary of his proposals was given in our issue of June 19 last, but we recapitulate the principal suggestions as far as they relate to tramway extension. Mr. Thomson recognises that the scheme proposed must be the work of years, but he emphasises the importance of consistent adherence to a comprehensive plan. Streets should be designed ahead of actual requirements, while the widenings of main traffic roads could be carried out as opportunities permit and as parts of a feasible scheme of new main traffic roads. Such a plan would ensure the necessities of traffic being provided for in a systematic design of roads, tramways, and their connections, so that expedition and economy in transport would result.

An important feature of the programme is an outer ring road, which would be formed mainly through undeveloped land.

The ring road would connect at both ends with the river front, and extend along the east, north, and west undeveloped parts within and beyond the city, forming junctions with important roads. The length of this ring road would be seven miles, and its width 160 ft., comprising a central tramway track laid in the grass, two carriageways, one on each side of the tramway, and two ample footways, and having also six rows of trees, two along the tramways and two on each of the footways. Only a portion of the length and width of the road would at the outset be opened up. When completed, with its provision of two carriageways for traffic travelling in opposite directions, its separate track for swift tramway service, its easy gradients, and its junction with main arterial roads, it should become one of the most useful and attractive of traffic and pleasure thoroughfares, opening up building land with exceptional frontages for residences.

Unquestionably the advantages of such a method of construction are many. The roads would be beautified and would partake in the outskirts of the nature of avenues; the cost of track construction would be largely reduced; the expense of upkeep would be considerably less; there would be much saving in wear and tear of rolling stock; the cars would run more smoothly; there would be less noise and dust, and there would be no obstruction by ordinary traffic.

With such plans in view the Dundee Tramways Committee, over which Mr. S. A. Johnston ably presides, and their general manager, Mr. Peter Fisher, may well look forward to a period of great expansion in their work and responsibilities.

Dublin Tramway Extensions Foreshadowed.—The Dublin Corporation, after discussing the loan offered by the Development Company of Ireland for housing purposes, resolved to ask the company to place £1,000,000 to the credit of the Corporation at once, in order that the housing plans already decided upon may be undertaken forthwith. The total sum required for housing in Dublin is stated to be £12,000,000, and this sum will be raised by the loan in question later on.

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FUEL SAVING BY ELECTRIFICATION OF RAILWAYS.

Electrification of railways proceeds at a slow pace in this country, but everyone entitled to an opinion on the subject is agreed that it is bound to come. Perhaps a clearer knowledge, more generally diffused, of the advantages likely to result from the change might stimulate activity not a little. Economy of British coal resources is recognised as a matter of deep national interest, and electrical schemes have a direct bearing on the subject. Up till the present, the monetary saving to be effected by substituting electric power for the steam locomotive on railways has been largely speculative. We have too little practical experience to go upon. In the circumstances it may be possible to learn something from American experience.

Mr. W. J. Davis, jun., Pacific Coast engineer of the General Electric Company, has contributed to a recent number of the *General Electric Review* an article on "Railroad Electrification as a Fuel Conservation Measure," which contains a number of striking facts and comparisons. American experience differs in many respects from anything possible under British conditions, but the facts have a fundamental bearing on the question of railway electrification everywhere. Mr. Davis begins by premising that there are two points from which the subject may be viewed. These are :—

"(1) The possible saving that may be effected by the replacement of the steam locomotive equipment now in use with electric locomotives supplied with power from modern steam-electric generating plants of large capacity, suitably located with regard to cheap fuel and water, and distributing over large areas through high-voltage transmission systems.

"(2) The saving to be expected by comparing the possible performance of modern compound steam locomotives, using high superheat, with a system of electrification and power supply as above outlined."

According to the reports of the Interstate Commerce Commission, the total gross ton-mileage of the railways in the United States, in the year 1914, was approximately 1,043,960 million ton-miles. A large proportion of that total is in two items which electrification modifies. One is the movement of railway company coal, amounting to over 57,000 million ton-miles, and 74,630 million for locomotive tenders. The former item, Mr. Davis contends, can be reduced by a fourth under electrification, and the latter eliminated altogether. These reductions amount to a saving of about 13·12 per cent. on the whole.

In estimating the fuel consumption of the electric power plants required for the remaining ton-mileage, Mr. Davis proceeds, we can take as a basis for our calculations the results of some tests made on the Chicago, Milwaukee, and Puget Sound Railroad, between Three Forks and Colorado Junction. The net energy consumption in a round trip over this section of heavy grades and curvature, using regenerative braking, was 23·75 watt-hours per ton-mile at the locomotive, including power required for all of the auxiliary apparatus. The energy consumption of the same train on level track of the same curvature as determined from the known train weights, profile, and locomotive efficiency, was found to be 20·4 watt-hours per ton-mile. These results are of particular interest, as they show that, with electric locomotives and regenerative braking, it is possible to eliminate a large proportion of the mountain grades, in so far as they affect the power required for moving the trains.

Suppose a transmission efficiency of 72 per cent. from the power station busbars to the collectors of the locomotives, the energy consumption at the power house, using the larger test as a basis, is found to be 33 watt-hours per ton-mile. Assuming, then, a total ton-mile movement of 906,330 millions, the energy consumption required by complete electrification would be 30,000 million KW. hours, to which should be added 20 per cent. for shifting and yard movements, and additional requirements of suburban passenger service, making 36,000 million KW. hours as a total energy consumption for the completely electrified system. On the basis of an operating economy of 2·2 lb. of coal per KW. hour, the annual fuel requirements for electrification would be 39·5 million tons of coal. The actual amount of coal consumed by the railroads in 1914, for locomotive use alone, including an allowance of 4 bbl. of oil per ton of coal, has been found to be approximately 120 million tons, or about three times as much, and the total saving to be expected in case of complete electrification would be 80·5 million tons. This is about one-sixth of the total coal production of the United States.

The point may be raised that the foregoing calculations are hardly fair to the steam locomotive, as we are comparing a highly efficient modern electric generating station system with a variety of steam locomotives, many of them old and inefficient types, and that the modern compound steam locomotives using high steam pressures and high superheats might accomplish almost as great savings as would be obtained by electric haulage. This cannot be true owing to a number of factors inherent in the two systems. On the one hand, the large central power station utilises steam power more effectively than locomotives, and eliminates unavoidable losses on the steam locomotive, such as standby steaming, radiation of heat in cold weather, forced draught of furnaces, and other causes, which are believed to consume nearly 30 per cent. of locomotive fuel. On the other hand, the steam locomotive is a single-unit plant, and therefore does not afford the scope for economy in operation which is found in a central power station.

The effects of the foregoing factors may be seen in a comparison of accompanying tables, in which the economy of a large turbine-generator station, operating under steam conditions demonstrated to be commercially practicable, is compared with that of a high-grade compound locomotive working at the maximum practicable steam pressures and super-heats.

CENTRAL STATION STEAM PLANT.

Assumed steam pressure, lb. gauge	300
Superheat, deg. F.	250
Vacuum (30 in. bar)	28·5
Temperature of steam, deg. F.	672
Total heat above 32 deg. F., B.T.U.	1345·8
Available energy per lb. of steam, ft. lb.	340,500
Heat efficiency	33·8
Efficiency of turbine including generator losses, per cent.	78
Efficiency of boilers, per cent.	75
Thermal efficiency of turbine-generator, per cent. $= 33{\cdot}8 \times 0{\cdot}78 \times 0{\cdot}75 =$	19·8
B.T.U. per KW. hour at generator $= \frac{3412}{0{\cdot}198} =$	17,230
B.T.U. per KW. hour at switchboard allowing 2·5 per cent. for auxiliaries, etc.	17,660
Assumed load-factor, per cent.	50
B.T.U. per KW. hour output of plant at 50 per cent. load-factor	21,200
Estimated lb. coal of 11,500 B.T.U. per KW. hour output of plant	1·84
Assumed lb. coal per KW. hour allowing for average monthly operating conditions, possible deterioration of plant efficiency due to bad water conditions and other causes, variations in operating personnel, etc.	2·2

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Assume average efficiencies of transmission and conversion from power house to drawbars of electric locomotive as follows :—	
Step-up transformers, per cent.	98·5
Transmission line, per cent.	95
Step-down transformers, per cent.	97·5
Conversion apparatus, per cent.	88
Trolley distribution, per cent.	90
Locomotive, per cent.	88
Combined efficiency power house to locomotive drawbars, per cent.	63·4
1 lb. of coal of 11,500 B.T.U. per drawbar H.P. hour $= \frac{2·2}{0·634} \times 0·746 =$	2·59

COMPOUND LOCOMOTIVES WITH SUPERHEATERS.

Assumed steam pressure, lb. gauge...	225
Operating steam temperature, deg. F.	625
Superheat, deg. F.	227
Total heat above 32 deg. F., B.T.U.	1326·6
Available energy per lb. of steam, ft. lb.	184,500
Heat efficiency, per cent.	18·5
Efficiency of engine (steam and mechanical), per cent.	75
Efficiency of boilers, per cent.	65
Efficiency from fuel to drawbar, per cent. $= 18·5 \times 0·75 \times 0·64 =$	9·02
B.T.U. per drawbar H.P. hour $= \frac{2550}{0·0902} =$	28,300
Assume load-factor, per cent.	25
B.T.U. per drawbar H.P. hour at 25 per cent. load-factor	46,000
Assume standby and other unavoidable abnormal losses per cent.	30
Total B.T.U. per drawbar H.P. hour	65,700
Lb. coal of 11,500 B.T.U. per drawbar H.P. hour ...	5·71

It will be seen from these tables that highly efficient compound non-condensing steam locomotives of modern type, operating in railway service as it exists to-day, would require to use about 2·5 times as much fuel as required by an equivalent electric system. If we assume the total fuel requirements of the two systems to be in the ratio of the estimated economies shown, with allowances for reduced ton-mileage accruing from the use of electric locomotives, the saving in fuel on this basis for 1914 would have been 73 million tons.

It is believed that this comparison is conservative, as no advantage has been taken of the possibilities of improvement in steam power plant economy by the use of unusually high steam pressures or superheats. There are a number of large steam power plants in the United States now operating under a monthly average of less than 20,000 B.T.U. per KW. hour at the switchboard. The assumed distribution and conversion efficiencies are also within the limits of well-established conditions of design and operation.

In the steam locomotive calculations, the efficiency of the engine includes all frictional, condensation, and radiation losses in the engine when operating under normal conditions. The standby losses cover the fuel required to kindle and clean fires under boilers, and maintain the steam pressure when locomotives are standing or in a condition where no steam is being used for locomotion. A small allowance has also been made for losses due to extreme cold weather and abnormal forced draught conditions.

In our final consideration of the possibilities of fuel conservation by electrification of the railways, says Mr. Davis, we must not overlook the fact that in large steam plants it is feasible and often economical to burn low-grade coals, whereas the steam locomotives require the higher grades of selected lump coal. This will release a large part of our highest grade fuel, which may be applied to our growing merchant marine demands and to household uses.

Making every allowance for the differences between American and British conditions, the facts adduced furnish very strong arguments for speeding-up railway electrification in this country.

SINGLE PHASE VERSUS CONTINUOUS CURRENT IN RAILWAY ELECTRIFICATION.

By E. Goolding.

It is to be anticipated that the work of electrifying London suburban lines will shortly receive a considerable impetus, which naturally gives rise to conjecture as to the extent to which railway electrification will be carried out and as to the system that may be adopted. There is reason to believe that preparation for converting a number of steam-operated lines into electrically-operated systems will shortly commence. In fact there is every indication of good prospects for electrical contractors, and some of the schemes once so elaborately estimated upon will no doubt again come up for consideration.

It is now 15 years since the electrification of the first lines of the Lancashire and Yorkshire and the North Eastern Railways was completed, and we have even yet done little towards general electrification or standardisation. True, the London Brighton and South Coast with the Midland Railway have branches of their lines running on the single-phase system, and the London and South Western, London and North Western, and London metropolitan railways, etc., have followed the third rail system for the electrification of sections of their lines. It is to be hoped that from the work already done some conclusive evidence for or against the adoption of the different systems of traction for suburban railways may be obtained.

The whole question of the electrification of suburban lines centres round the all-important items of capital cost, safety, efficiency, and maintenance, and it is therefore evident that to extol the respective merits of the low tension continuous system employing third rail or the single phase alternating current system using overhead construction, or the polyphase system employing induction motors is for all practical purposes useless unless the expenditure involved by the respective systems is given. On the extra item of expenditure for electrification, interest has to be paid, and it is necessary, before the work is undertaken, to ascertain whether outlay is justified by the prospects.

This question has to be carefully considered and due value given to the effect on the railway system as a whole. The development of traffic has had a surprising impetus where electricity has been substituted for steam, and there is every reason to anticipate that the key to a gradual alleviation of the present financial position and traffic congestion will be found in the advantage accruing from the installation of electricity as a motive power.

At present we are faced with the fact that there is an amount of indecision between the adoption of L.T. D.C. third rail and H.T. single phase overhead, not to mention their varied forms of application and distribution ; such systems as H.T. D.C. overhead, and the polyphase system with induction motors, etc., are at present more or less out of the running.

It is therefore to be hoped that the practical results obtained in actual running of the systems of which we have had home experience, together with cost, will be collected and compared to assist in deciding the chief points connected with the use of the L.T. D.C. third rail, and the working experience of the single-phase system ; so as to enable a definite decision to be made in favour of one or the other, and to accept the best to form a standard system. It will be understood that every case must be treated on its own merits, as it would be hopeless to take an individual figure *pro rata* unless the classification of cost obtained were the outcome of a prearranged schedule of items. For

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instance, the cost might be proportionately allocated to such points as—

Class of service :—

1. Suburban lines or inter-urban.
2. Branch or urban lines.
3. Long distance or semi-express.
4. Goods.

Conditions :—

5. Speed.
6. Maximum speed to attain schedule time.
7. Number of stops and distance apart.
8. Acceleration necessary.
9. Gradients.

All these conditions and surroundings must, of course, play an important part in the construction and the working cost of every undertaking.

It will be generally admitted that the third rail system costs less and is more efficient than the overhead system ; that is to say, the cost per mile of line for a complete system, power house, sub-station, and rolling stock and track equipment, equipped on the latter system, would mean an additional expenditure of about 25 per cent. In view of this, it is advisable to dissect the items of expenditure in order to ascertain the cause and reason of this difference in cost, then to balance the pros and cons as to the ultimate advantages to be gained by the respective systems, and to consider whether the overhead system gives a corresponding return in safety of operation or economy in working so as to merit the additional outlay involved. The items which are accountable for the extra cost with the single phase overhead system are : track equipment, generating stations, and rolling stock.

In the first case the cost of equipping the track varies very considerably, but roughly speaking the overhead work costs approximately three times as much as the third rail system. This might at first sight appear exaggerated, but overhead work is open to considerable variation, being entirely dependent on the amount of " special " work to be done, owing to obstructions, alterations to signal gear, and buildings, etc. On the other hand, with third rail construction, as a rule, few structural alterations are necessary, and the rail can be dropped between the tracks and erected piecemeal as traffic will permit. This arrangement is hardly possible in the erection of the steel girders placed across the track rails for supporting the conductors from catenary cables (necessitating the handling of six wires), for the obvious reason that to carry out the work on embankments, viaducts, bridges, and stations, and the special work in tunnels, involves very heavy cost for labour on account of the interruptions necessary to avoid hindrance or the possibility of danger to passenger or goods traffic. As a comparison it can be readily understood that if the price of several pre-war contracts for erecting one mile of overhead work for a tramway along a London suburban road on the span wire method of suspension works out at an average rate of £1,800 per mile, the additional amount of material and work needed to erect a double catenary suspension carried out under the present adverse conditions of railway traffic, would cost about £7,000 per mile, as against, say, £2,300 per mile for third rail equipment.

The next item of additional expenditure incurred for the single phase system is due to the fact that the size of the generating station is 20 per cent. larger than with the third rail system. The increased capacity of the power house is required because the energy consumption is 20 per cent. greater with single phase working, due to the electrical losses in transformation and motors, and also to the electrical equipment being some 30 per cent. heavier than the continuous current equipment. In regard to the supply of new rolling stock and the equipment of a number of existing coaches, an expenditure of 25 per cent. more is required for single phase system than is necessary for the continuous current equipment.

Had some of the lines employing continuous current used single phase, the trains would have been at least 30 per cent. heavier and energy consumption increased in proportion. As regards the cost of rolling stock equipment for single phase it might conceivably be nearly double.

It might be of interest to consider a summary of the relative merits and possibilities of the different systems :

1. In the first case the equipment of the track with the overhead system costs three times that of the third rail.
2. As far as at present ascertained, single phase motors have not the same efficiency or range of power as continuous current motors. The power house has to be 25 per cent. to 30 per cent. larger in capacity to supply the greater energy consumption than is the case with continuous current.
3. The rolling stock for the single phase system is 30 per cent. heavier for a loaded train of given capacity than with the continuous current equipment, and the cost may be taken as 50 per cent. more.
4. The wear and tear on permanent way will be greater with the single phase system, due to the heavier rolling stock.
5. The repair and upkeep of overhead system will be of greater expense, and cannot be undertaken with the same care and ease as the third rail, which can be disconnected and replaced.

In view of the lower cost and simplicity of construction and our successful experience in operating trains on the third rail or low tension system, it is necessary that the single phase or overhead system must show some distinct advantages if it is going to be adopted in place of the latter system.

From the above it would appear that the outlook for the single phase system is rather black as applied to suburban lines, and doubtless this view is expressed in practice by the simple fact of the third rail system being installed on the majority of lines ; perhaps the most important point is that it has been considered the best system to adopt on the most recent work at home and abroad.

We have so far had in mind suburban lines which are at the moment of first importance where stops are made at stations only a few miles apart, and acceleration becomes a necessity to maintain the maximum rate. In this case the D.C. equipment offers higher efficiency and acceleration, but should the train service be of infrequent stops, or in the nature of an express service, the single phase motor is far better suited for the conditions, and the system has certain other advantages, such as the low cost of sub-station equipment, and simplicity of operation, as against rotary converters.

Another point to bear in mind with single phase is the loss due to impedence for the track return current. To obviate this loss in rails, copper cables can be laid and, of course, that involves additional expense.

Owing to the low voltage of D.C. systems at present installed, large steel conductors have to be laid on the track to supply the heavy current necessary. These large conductors obstructing the track are a source of danger and a bugbear to the system, more especially if the tendency to increase the voltage is continued. To eliminate this trouble, either some

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further improvements must be made in third rail design or copper conductors must be place overhead. As things are now the latest systems that have been put down, the third rail is at 800 volts. The average area of a steel conductor at 500 volts is 9 sq. in. or = to ·9 sq in. of copper, and 800 volt steel conductor is = to 8·5 sq. in. area or ·85 sq. in. of copper; hence to increase the voltage to, say, 1,200 would only represent ·5 sq. in. of copper, or a conductor equal to three times that of tramway work, and the overall diameter would be about $\frac{3}{4}$ in., which would not present much difficulty in erecting on the single catenary system. It must be remembered that a modified form of heavy tramway overhead work is in successful operation for electric haulage of goods at home, and that the Buenos Aires subway recently built is operated by continuous current with a simple and effective overhead work.

Admitted that the overhead system would involve additional expense over third rail, the compensating advantages are considerable and include clearway on track and elimination of the danger always present with conductors obstructing the permanent way.

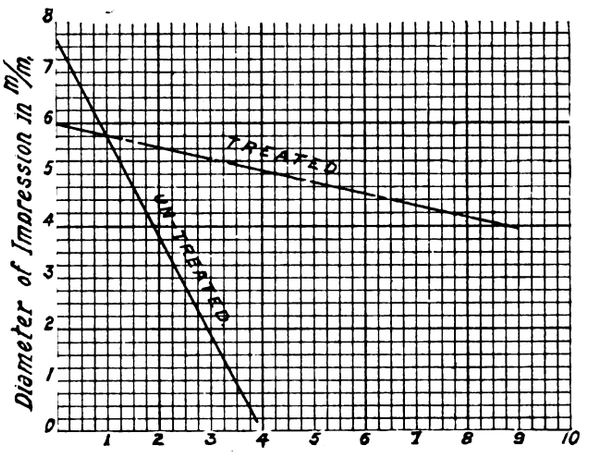
When comparing alternative systems, due value must be given to the importance of practicability and efficiency or, in other words, the general manager's view should predominate where certain results are aimed at, viz.: Return for capital expenditure, rapid acceleration of trains, improved service, low energy consumption, minimum of danger, and low maintenance costs.

The system that would be selected is the one found to comply best with the above conditions.

SANDBERG'S "IN-SITU" TREATMENT OF EXISTING TRAMWAY RAILS.

The Croydon Corporation have placed an order for the treatment of a further length of track with Sandberg's "In-situ" process, and it is interesting to recall that the Croydon Corporation was the first tramway undertaking to adopt this treatment on a practical scale. This was eighteen months ago, and since then the Corporation has placed several repeat orders for the treatment of rails, joints, and the checks of curved rails. While it is early, as yet, to obtain definite information in regard to the relative rates of wear of treated and untreated rails, it is a fact that in no instance, either in Croydon or elsewhere, have corrugations reappeared on rails from which they were removed before treatment, neither have they appeared on any treated rails. Whilst there is ample evidence of the fact that the development of corrugations is retarded, some time must elapse before it can be definitely claimed that the "In-situ" treatment is an infallible remedy for this prevalent evil. At the same time it has been established at Croydon and on other tramway systems that the flow of metal due to the cold rolling action of the traffic, to which rail steels are liable, has been retarded to an appreciable extent. This finding has a very definite bearing on the question of corrugation in rails, for whatever may be the actual cause or causes of corrugation, its development is dependant upon the flow of metal in the rail tread, and once this is prevented or retarded the mitigation or prevention of the evil is assured. The late Mr. Stephen Sellon, who probably had a greater experience of the wear of tramway rails and of rail corrugations in this country than any contemporary tramway engineer, held the opinion that rail corrugations were, apart from the actual cause thereof, due to the cold flowing of the metal in the rail tread and to the elastic limit of the steel being exceeded.

As a remedy he recommended raising the elastic limit of the steel to 60 tons per sq. inch. As far back as 1911 Mr. G. E. Pellissier, in the New York *Electric Railway Journal*, advanced the theory that corrugations only occur when the pressure at the point of maximum intensity exceeds the elastic limit of the steel at that point, and he advised the raising of the elastic limit of the steel. A similar theory based upon the cold flowing of the steel, due to inadequate contact between wheel and rail and the low elastic limit, was dealt with by Mr. R. C. Cram, of the Brooklyn Rapid Transit System, in the same journal in 1915, and from many other authoritative sources there is evidence that the elastic



Number of Months Wear.

limit of the tread of present-day tramway rails is too low. With rails of normal carbon content the elastic limit of the tread may be increased to 60 tons per sq. inch and upwards by means of the "In-situ" process, and the hardness as indicated by Brinell instruments raised from 250 to 500 and beyond.

The diagram reproduced here is a record of the appearance of impressions made in rails on the Croydon Tramways over nine months ago, and is typical of results obtained on other tramway systems. The impressions referred to were made with a 10 mm. hardened steel ball. The diameters of the impressions have been measured from time to time as they gradually decreased, and in this typical case it is interesting to note that the impressions made on untreated rails 7·5 mm. diameter disappeared after four months in service, whilst impressions 6 mm. diameter made in rails which were subsequently treated are still 4 mm. diameter after nine months under the same traffic conditions.

It is not claimed that the disappearance of the impressions on the untreated rails necessarily means that the surrounding metal has worn entirely away to the depth of the recess, but that the flow of the metal in the treated rails has been arrested and the combined wearing and cold rolling displacement effects are greatly reduced by the treatment of rails by the "In-situ" process.

American Electrical Plant for Cape Town.—A Press message from Cape Town dated August 30 states that the City Council have reluctantly decided to place an order with the General Electric Company, of America, for new electrical plant to the value of £28,278. Several British tenders were received, and the difference in price was not considered material. British tenderers were, however, unable to offer early delivery, and as the new equipment is urgently required to avert a threatened breakdown of the electric system, the Council felt compelled to accept the American offer.

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THE EDITOR will be glad to consider articles by experts. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, SEPTEMBER 11, 1919.

Government Recognition of Standardisation.

There was a time when the freest competition for designs in engines, machine tools, electrical appliances, and equipment for railways and tramways was absolutely necessary. It is hardly possible to give an exact date for the limit of that period, but so far as railway and tramway appliances are concerned the period of free experiment may be said to have come to a close during the first decade of the present century. During that time the equipment of tramway cars, sections and weights of rails, motors, gears, axles, wheels, etc., have tended to approximation; in all essential respects tramway plant and equipment have settled down into definite types. With a few exceptions the whole of the tramway systems in the United Kingdom could be operated with a few types of plant and rolling stock, and either of two modes of traction, without loss of efficiency, to say the least. Arguments for standardisation in manufacture of tramway appliances are so irrefutable, so clear, so self-evident, that they have become trite, commonplace, and so stale that no one cares to listen to them. No one cares to deny the economy which can be effected by dispensing with a multiplicity of designs, drawings, patterns, etc. The advantages of interchangeability and bulk production are known to everybody. But still the practice of standardisation spreads slowly and haltingly, and it is useful to inquire seriously into the causes of obstruction. The main cause is the inability of existing standardising authorities to enforce their decisions. For instance, the Engineering Standardisation Committee has done splendid work, and merits the guerdon due to those who subdue opposition by reason, but it cannot deal with irrational conservatism or the self-interest which sees in departure from accepted practice a means of profit. In the absence of a legal authority to enforce standardisation, the manufacturer has neither the guarantee that he will obtain more orders nor the assurance that his rivals will not exclude him from the markets for which they cater by adopting gauges and sizes varied from what is supposed to be the standard laid down for all. Here is a case which contradicts the Adam Smith dictum that if a man promotes his own business interest he will inevitably add to the prosperity of the community. It is the interest of the community that standardisation, with bulk production and consequent reduction in cost of production, should prevail; but it may pay a manufacturer to produce sizes and types of motors, gearings, etc., varied from the standard, with the object of preserving intact his own circle of customers, while sparing himself the trouble and expense of adopting standardised methods. In the long run the manufacturer may stand to lose, but he may only want a short and prosperous run. Men do not enter business for fame, but to realise a good profit on their capital while it lasts. In cases where the interest of the individual is contrary to the welfare of the community, the latter must prevail. Hence common law and every form of legislation. In this country freedom of the individual and of trade is too precious a principle to be restricted except upon good cause shown. The advocates of standardisation in engineering, however, have made out a sound case for legal enforcement, and it is satisfactory to learn from the Premier's latest pronouncement, which is given elsewhere in this issue, that the Government contemplates

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legislation which will give authority to standardisation of engineering and transport equipment wherever it can be shown that it will be of advantage to the industry as a whole and to the community.

Information the Public Appreciate.

Though the tramway industry is scarcely sixty years old, legends of the "good old days" are already current. According to the narrators of these pleasing recollections, the era of the horse-drawn car was one of idyllic simplicity and harmony. The relations between the passengers and the authority of the undertaking were characterised by a delightful friendliness and simplicity. Arrangement of the services and fares was made by a kind of mutual agreement; it was sufficient, when any change of route or time of service or alteration of fare was made, that a bill stuck up on the car window should announce the fact. Very possibly the harmony of the past is an illusion, and that the altercations of aggrieved passengers with harassed conductors over fares and services are merely forgotten. Admitting to the full the adequacy of such simple methods of publicity, and the perfect understanding established between tramway passenger and operator by word of mouth information, on a small system operated by horse-drawn vehicles, it is no proof that such practices are suitable for the tramway systems of the present day. And yet the casual, slow-going style of announcing facts of importance to tramway passengers still prevails on many systems in this country. Since 1914, tramway services have been curtailed, changes have been made in times and routes, fares have been raised, stages altered, and the only intimations vouchsafed a long-suffering public have been notices posted more or less conspicuously in or on the tramcars. The amount of friction generated has been incalculable, and in consequence tramways have declined in popularity. One of the principal causes of the decline has been the confusion of the public mind brought about by changes of which passengers have not been efficiently informed. Mysteriously, and without reason given, the passenger finds his customary car taking him along an unfamiliar route; having paid his usual fare, he innocently rides past the stage for which he has been charged, and is peremptorily called upon to pay another penny. Irritation and dislike are the natural consequences. All that could easily be avoided by a definite system of publicity. Let the tramway authority lay out a clear plan of the alterations in routes, times, and fares, and take the means of publishing the plan in the most efficient way consistent with reasonable economy. In a developing business like the tramways the management must be free to make changes. Circumstances vary even in normal times, and in these days the variations are bewildering even to the most sagacious. Printing, paper, and advertising space in newspapers have become costly. But it may be asserted with the assurance of proof in the results that even if every important alteration in fares, stages, time tables, and routes were to involve complete republication of the whole record of a tramway system, it would pay. Publication of railway time tables, as everyone knows, added greatly to the popularity and the revenue of railways, and a result even more beneficent would follow the issue of complete tramway time tables and fares tables at regular intervals. Two strong objections may be offered to the idea of issuing tramway time tables. The first is that in a method of traction subject to so many accidental interruptions the services could only approximate to the times laid down. The second objection is that a publicly advertised system ties the hands of the management, and hinders adjustments which may be necessary from time to time. With regard to the first objection, it may be pointed out that every tramway system has time tables for the control of operation, and that a simple disclaimer of responsibility on the time table published would protect the authority from public action. In the second objection there is involved a great deal more than can be discussed openly; but perhaps some advantage might result if all tramway officials could be brought to realise that the days of experimental work on tramways are mostly over, and that a permanent, reliable, and systematic service is the essential requirement of the present day.

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The Transport Act.

At long last the Ministry of Transport Act was passed into law just before the close of the Parliamentary session in August. It is a highly important measure for all forms of inland transportation, both of passengers and goods, and it is hoped that under the wide powers given to the Ministry it will be possible to co-ordinate, improve, and develop all the undertakings concerned to a height of efficiency and economy hitherto unknown. The power of the Ministry appears to be ample, and the amendments which were made in the Bill in Parliament, in providing for advisory committees and so forth, have not seriously curtailed those powers, while they have provided safeguards. No one can yet say precisely what the Ministry will do, but there are certain to be great changes. Probably railways will be affected more than any other class of undertaking. Much may be done during the two years period, but it has to be remembered that the greatest changes will probably come after that. As to tramways, three main points of the Act are that the existing powers of Government departments are transferred to the Ministry, that the latter takes possession (that is, control) for two years of all tramways and light railways other than those belonging to local authorities, and that the Minister may if necessary compel owners of adjacent tramways to carry out through running arrangements. At the end of the two years we may no doubt look for new proposals to Parliament, based on the experience gained. It is not possible to co-ordinate the tramway systems of the country, because they do not form a continuous whole like the railways, but a good deal may be done, because by other sections of the Act the Minister may establish and work transport services (including tramways), and may advance money to other people to enable them to do so. The hiatus is the exclusion of municipal tramways from the general control. This may prove such a stumbling block in the way of general schemes, that alterations may be brought forward at the end of two years. The municipal tramways were excluded, according to the Government, because they wanted to be and also because they were prosperous—not very convincing reasons. In any event there seems to be a prospect of considerable new construction and it will not be blocked by the labyrinth of private legislation procedure in Parliament.

ELECTRIC RAILWAY SITUATION IN THE UNITED STATES OF AMERICA.

Investigation by a Federal Commission.

While British tramway undertakings have scarcely begun to tabulate their difficulties, the American Electric Railways Association has secured the appointment of a Federal Commission by the President to investigate the electric railway situation.

President Wilson has constituted the Federal Commission as appended :—

Hon. Charles E. Elmquist, chairman, president and general solicitor of the National Association of Railway and Utilities Commissioners, representing the National Association of Railway and Utilities Commissioners.

Hon. Edwin F. Sweet, vice-chairman, assistant secretary of the Department of Commerce, representing the Department of Commerce.

Eugene Meyer, jun., managing director of the War Finance Corporation, representing the Treasury Department (Louis B. Wehle, counsel, War Finance Corporation, will serve in Mr. Meyer's place during his absence in Europe).

Dr. Royal Meeker, statistician of the Department of Labour, representing the Department of Labour.

Hon. George L. Baker, chairman of the organisation committee of the American Cities League of Mayors, representing the American Cities League of Mayors.

P. H. Gadsden, chairman of the committee on readjustment of the American Electric Railway Association, representing the American Electric Railway Association.

Charles W. Beall, of Harris, Forbes and Company, representing Investment Bankers' Association.

W. D. Mahon, president of the Amalgamated Association of Street and Electric Railway Employees, representing the Amalgamated Association of Street and Electric Railway Employees.

C. Ogburn, executive secretary.

A committee of one hundred has been appointed to represent the electric railways before the Federal Commission. The case has been prepared by a committee on presentation and a committee on recommendations, and it has been presented under three headings :—(1) Present conditions of the industry ; (2) the causes which have led to these conditions ; (3) suggested avenues of escape. The array of witnesses comprises men thoroughly familiar with the various phases of street and electric railway operation, finance, and economic theories which govern public utilities. Included in the list are some of the best known men in America—financiers, economists, and men thoroughly acquainted with public life. Mr. J. K. Choate is the chairman of the committee on presentation, while Mr. O. D. Young presides over the committee on recommendations.

Publicity work is playing an important part in the proceedings. Mr. Barron G. Collier, of Barron C. Collier, Inc., a well-known New York firm of advertising agents, has lent the association the use of so much of his staff as is necessary, and has sent one of his best men to Washington to take charge of the work there, and also maintaining a working force in New York.

No Season Tickets on L.C.C. Tramcars.—For some time an agitation has been going on, urging the London County Council to institute a system of season tickets on the tramways. At a recent meeting of the Council, Mr. A. L. C. Fell, general manager of the tramways, pointed out that, as the conductors could only ask to see the covers of season tickets, the system would lend itself to wholesale fraud. It was agreed that no season tickets be issued.

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TRAMWAY EMPLOYEES' DEMANDS.

MEN'S CLAIMS TO BE SUBMITTED TO ARBITRATION.

Special conferences of the Municipal Tramways Association and the Tramways and Light Railways Companies were held at the Surveyors' Institution, London, on September 4, to consider the proposal put forward by the National Transport Workers' Federation that the demands made by tramway workers all over the country should be submitted to arbitration.

These demands are as follows :—

(1) An increase of 12s. in the guaranteed weekly wage for all employees of 18 years and over engaged in tramway and omnibus undertakings or companies in this country.
(2) An advance of 6s. for all employees of under 18 years of age, in the above-named undertakings or companies.
(3) A proposal that the qualifying period minimum to maximum rates of pay for all employees aged 18 years and over should not exceed six calendar months.
(4) The merging of all war increases into permanent wages.

The employers originally refused to negotiate on any of the demands except the qualifying period for the maximum pay ; but the Transport Workers' Federation requested another joint conference, and this resulted in the arbitration offer being made.

The Executive Councils of the two Associations met separately on the morning of September 4, and in the afternoon of that day there were joint meetings of these bodies.

Association Assent to Arbitration by Districts.

Alderman James Bowes, of Manchester, presided at the meeting of the Municipal Tramways Association. It was a fully representative gathering, about 80 local authorities from all parts of the country being represented. After a free expression of opinion on the proposals submitted by the National Transport Workers' Federation, the following resolutions were passed unanimously.

(1) That in view of the present financial position of the tramway undertakings, no further increase of wages can be granted without either (*a*) raising the fares, or (*b*) increasing local rates to meet deficiencies.
(2) That the circumstances of different parts of the country vary greatly, and, therefore, it is impossible to deal with the whole matter in one arbitration.
(3) If arbitration is adopted, it must be in districts throughout the country, in accordance with the Wages Regulations Acts.
(4) That in view of these facts, we are prepared to accept arbitration through the Minister of Labour under the Wages (Temporary Regulations) Act, 1918, and the Extension Act of 1919.

Increased Fares a Burden on the Community.

After the meeting, Mr. J. Beckett, the general secretary of the Municipal Tramways Association, said it had transpired during their investigations that a number of the undertakings were already on the rates for subventions to meet the deficits that were being incurred. If anything else was added, it only meant further increases in local rate burdens. It was common knowledge in the North that any such burden would be put upon the backs of those sections of the industrial classes who were now receiving a lower rate of remuneration than the tramway employees, so that the position had been emphasised that the granting of the application would saddle a burden upon one part of the community to lift the wages of another part of the community.

Companies Statement of their Position.

The tramway and light railway companies also held a meeting during the afternoon, at the conclusion of which it was announced that it had been decided to send the following letter to Mr. Robert Williams, secretary, National Transport Workers' Federation :—

Dear Sir,—I am directed to inform you that at a conference to-day of representatives of company-owned undertakings the report of the special committee appointed to meet your representatives regarding the application dated 5th July for (*inter alia*) further increase of wages was considered. The Committee reported that they had intimated to you that the company employers were unable to accede to your application, but that, as an outcome of the discussion, it was suggested that the matter should be referred to arbitration.

The conference, after considering the report of the Committee, desire to take this opportunity of supplementing the statement put forward at the recent meeting with yourselves regarding the extraordinary difficulties of the situation. In consequence of various awards and agreements very substantial increases in wages have been conceded, which, in the view of the conference, have kept pace with the gradual rises in cost of living, and tramway men are now in receipt of a wage which bears a proper relation to that of employees in other industries. The cost of operating tramways has increased enormously. It is true that revenue has also increased, but not in like ratio, with the result that on many company-owned tramway undertakings ordinary working expenses, including deferred maintenance, are in excess of revenue. The position, therefore, is that the companies cannot increase their wage bill without disastrous consequences. The advances which have already taken place, coupled with the extra cost of every commodity necessary for the running of a tramway, are such that many of the company-owned undertakings are faced with the prospect of insolvency.

Experience has clearly shown that unless net revenue is considerably augmented, many company-owned undertakings cannot continue to operate. Additional revenue can only be obtained from the passengers and as tramway undertakings are unable, due to statutory and economic limitations, to increase fare rates indefinitely, their position is extraordinarily difficult.

Having regard, therefore, to the above circumstances, the conference is of opinion that the company employers are not in a position under present circumstances to entertain any proposal which involves increased expenditure. As you have already taken the necessary steps to bring the difference that exists between us before the Minister of Labour under the provisions of the Wages (Temporary Regulations) Acts, 1918-1919, under which the Minister of Labour has powers to refer such differences to arbitration by districts, we assume that we shall be hearing further from the Minister of Labour in due course.—Yours faithfully,

(Signed) A. de Turckheim, Secretary.

Employees' Appeal to Labour Ministry.

The replies, and also one from an Association representing four London omnibus companies, were considered at a conference of Unions representing omnibus and tramway workers at the offices of the Transport Workers' Federation on the same night. Mr. Robert Williams, the secretary of the Federation, at its conclusion, said that the letters amounted to a refusal of the application for an increase in wages, and suggested arbitration by district, to which his Unioa was flatly and irrevocably opposed. They intended to send n deputation to the Ministry of Labour the next day to indicate that in no possible circumstances would they accede to the principle or arbitration by district, and it was hoped that the Minister would use the powers conferred upon him to avert what must inevitably arise—a national strike—if the policy of the three employers' associations were adhered to.

Arbitration Arrangements Settled by Ministry of Labour.

Sir Robert Horne, Minister of Labour, met representatives of the Municipal Tramways Association, the Tramways and Light Railways Association, and the Transport Workers' Federation, at the Ministry of Labour, on September 5, when the question of the reference to arbitration of the Federation's claim for an advance of wages to tramway workers was discussed.

It was agreed that the Minister of Labour should prefer the claim to the Interim Court of Arbitration under the Wages (Temporary Regulation) Act, the terms of reference to include a schedule of the undertakings which are affected by the national claim.

It was found impossible for the bodies to agree as to the arrangements for the hearing. The undertakings contended that the Court should hear the case in the districts. The Federation's representatives, on the other hand, declined to waive their point that the claim being a national claim, must be dealt with on a national basis, as had been the case at certain previous arbitrations. In the end, the Minister intimated that the question of the arrangements for the hearing was a matter within the discretion of the Court of Arbitration.

It was arranged that the case should be referred to the Court and that the Court should be asked to grant a preliminary hearing to the parties at 10.30 a.m. on Monday, September 15th, at which hearing the parties would put forward their respective contentions as to the procedure to be adopted.

At the preliminary hearing the Arbitration Court will be asked to make early arrangements for the further proceedings.

Whitley Council for the Cable Industry.—The Ministry of Labour announces that the first meeting of the Joint Industrial Council for the electric cable making industry was held at the Ministry of Labour on September 4. Mr. Bertram Wilson, of the Ministry of Labour, who presided during the earlier part of the proceedings, pointed out that this was the forty-fifth Joint Industrial Council to be formed. Mr. L. B. Atkinson, Cable Makers' Association, was elected chairman and Mr. A. Allison, of the Indiarubber, Cable and Asbestos Workers' Union, vice-chairman, and the following were appointed as joint secretaries :—For the employers' side, Mr. H. Standring (Messrs. Frankenburg and Sons, Limited) ; for the employees' side, Mr. H. McCale (Workers' Union).

Belgian Railway Electrification.—Early in September members of the Commission on the electrification of the Belgian State Railways visited this country and made a tour of inspection of some English electric railways. They were specially interested in the electrified lines of the London and South-Western Railway, where some of the conditions are similar to those on the Brussels to Antwerp railway, which it is expected will be the first to be electrified. Both on that Belgian line and on the suburban routes on the London and South-Western Railway the average distance between stations is about a mile and a half.

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WAR RECORD OF BRIGHTON CORPORATION TRAMWAYS.

A RETROSPECT BY THE GENERAL MANAGER.

Mr. William Marsh, engineer and manager of the Brighton Corporation Tramways, has included in his annual report an interesting retrospect of the war period as it affected the Brighton tramways, which we give below :—

In the spring of 1914 there was every prospect of a busy summer season. The traffic had been steadily expanding for several years, and in order to prepare for this three extra cars were built, which were finished about the end of July, and the necessary staff engaged to work them. On August 2nd and 3rd, 1914, the international situation caused the traffic to drop off, and on the 4th no less than 40 reservists, mostly conductors, received their mobilisation papers telling them to report for military service on Wednesday, August 5th. The consequence of this loss of staff was that nine cars had to remain in the shed on the second day of the August Races, which is usually the busiest day in the year, and all the efforts to provide the extra cars previously mentioned were thrown away.

The chief effect of the war at first, so far as difficulties were concerned, was the steady loss by enlistment of the men. By the end of August, 50 had joined up, followed in September by 23 more, and so on. It was a matter of the utmost difficulty to train men fast enough to take their places.

In the spring of 1915 it was quite evident that if the cars were to continue running there would soon be insufficient men to staff them, and so, following the lead of a few other towns, on May 22nd, 1915, 12 girl conductors took up the work the men had laid down, and soon won for themselves the best wishes of the travelling public. The number steadily rose until, in the summer of 1918, there were nearly 100.

There was less difficulty in keeping motormen, at first because of the higher pay than was generally given in other industries, and latterly because it became a reserved occupation after the Military Service Acts had been passed, but the physical standards of the men had to be very much lowered.

As an illustration of the difficulty experienced in staffing the cars, permits to learn driving were granted to no less than 342 men, which means that a number far in excess of that were interviewed and rejected as unsuitable. Of this number only 153 were able to get passed as good enough to be trusted alone with a car. The number of conductors engaged totalled up to 550, of whom 190 were men and 360 women.

This constant state of flux among the traffic staff during the whole period of the war naturally resulted in a large proportion of the staff being new to their work with the result that at times the public, who did not realise the difficulties which were being faced, were apt to be a little critical when things did not go quite as they would like.

The shortage of efficient motormen made it necessary for those who remained to work very long hours. The ordinary standard day was increased from 10 to 11 hours of actual work, and it became the exception for a man to be able to have his one day off per week. Many men worked 11 hours per day and seven days per week for months on end ; and if it had not been one of the healthiest occupations known, the men would not have been able to stand it. Time after time it was very uncertain one day whether it would be possible to get all the cars out the next day, and the worry and anxiety which this state of uncertainty brought about began to tell on all concerned. Taking things all round, the traffic staff have had the most difficult time to face of any in connection with this undertaking.

The war has been aptly described as essentially an engineer's war. The effect on the engineering industry was felt immediately, long before there became an acute shortage of labour, and as one firm after another gave up private work to undertake nothing but war work, it became a very serious problem whether it would be possible to keep the cars in operation, more especially as there were no essential war industries in Brighton, and therefore supplies were not so readily obtainable. Few people can realise the fight that was involved in keeping the cars in working order owing to shortage of supplies. The permanent way renewal work in August, 1914, was, if anything, in advance of strict requirements, and by its very nature could be allowed to go, the only difference being a certain amount of inconvenience to the travelling public.

Contrary to the generally accepted forecasts made in the early days of the war, the number of passengers carried has risen enormously, until at present the traffic revenue is very little short of double what it was only a few years ago, and this result has been achieved not only with the same number of cars but also charging the same fares until the last day of the year just closed.

An increase in the number of passengers carried from 10 to 18½ millions naturally caused a little overcrowding at times, which was made worse by the restriction laid down by the Board of Trade as to coal consumption in the summer of 1918. The above figures leave out of account the enormous number of wounded soldiers carried free between the hospitals and the sea front which must have amounted to half-a-million.

The full weight of the burden which will be laid on this undertaking by the war has not yet been felt in its permanent form, and until this is the case little can be said as to the probable future course of events. The maintenance of the track is below par. It has taken years for it to get into its present state, it will take some considerable time before the arrears can be made up. In the meantime a period of very heavy expenditure is in view. Some extra nett revenue could be earned by one or two much-needed extensions, powers for which should be obtained as soon as possible.

LONDON TRANSPORT COMMITTEE'S REPORT.

To the Editor of "THE TRAMWAY AND RAILWAY WORLD."

SIR,—I see from the newspaper reports that on Thursday, August 14, Lieut.-Col. Malone, M.P., asked the Prime Minister in the House of Commons whether the Government had considered the report of the Select Committee on Metropolitan Passenger Transport ; whether it is proposed to carry out the recommendations of that report ; and if so, when ?

Mr. Bonar Law made the following amazing reply :—" This report, which requires very careful study, is at present under the consideration of the departments concerned."

Surely it is the very height of absurdity that these departments, which it is suggested in the report should be superseded, and one of which is described as being " archaic, unbusinesslike, and utterly subversive of progress," should be consulted in the matter at all. Are we again going to have this matter shelved, as it was in 1905 ?

I would suggest that during September, or early in October, some member of the London County Council—say the chairman of the Highways Committee—should convene a meeting of representatives of all the Municipal Tramway-owning Authorities in Greater London, and the Parliamentary representatives of each of the districts concerned (and possibly the members of the Select Committee also), in order to consider this matter, and arrange for taking united and determined action to compel the Government (if necessary) to embody the recommendations of the Select Committee in a legislative enactment. The matter is of vital importance and should not be allowed to fizzle out, which, in view of the present action (or inaction) of the Government, seems a possibility.

Tramway Offices,
Walthamstow, E.,
August 19, 1919.

Yours faithfully,
WM. MURRAY,
Tramways Manager.

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TRAMWAY TRACKWORK SPECIALITIES.

No one knows better than the tramway track engineer that there is room for improvement in many details on rails and points. Crossings and junctions are troublesome, and yet no tramway system can do without them. The best that can be done is to reduce friction to the lowest minimum and to construct the rails and mechanisms of the points of such a form and material that they will resist whatever wear is unavoidable. In this respect, Hadfields, Limited, have been of great help to tramway track engineers. For over 20 years the firm has continuously specialised in rails, layouts, points, curves and crossings, adding one improvement to another, never satisfied that what is good may not be made better. From a finely printed and well illustrated pamphlet recently issued it appears that the firm have made another advance in the construction and adjustment of tramway junction points, in the shape of what is called the "Hadura" point, made of the well-known "Era" manganese steel. Tramway track engineers are already familiar with the principle of the self-adjusting point, but the "Hadura" has several new features suggested by practical experience. The heel end of the tongue has been given a larger bearing surface, and the tread is carried through the centre, so that the weight of the rolling load is better distributed. To ensure greater strength and rigidity, the tongue is increased in depth from 2 in. to 3 in. By the introduction of a sliding block, adjusting wedge, and spring at the heel end, any wear which takes place is automatically taken up. Hadfield's patent universal tramway point mechanism, standard tramway points and crossings, and steel-tired wheels, are also shown in the pamphlet, which, as already mentioned, is illustrated with very carefully reproduced photographs.

"A. W. P." Electric Arc Welding applied to Tramways.—Though comparatively new, the employment of electric arc welding for repairing metal structures has become an accepted practice in all branches of the engineering industry. One of the difficulties to be overcome in the electric arc welding process by means of electrodes, was the tendency of the added metal to oxidise and admit of the depositing of slag or other impurities. To obviate these defects, the flux-covered electrode was developed. Specialising in the composition of flux coverings, the Alloy Welding Processes Company, of Leadenhall Street, London, E.C., have done a great deal to advance the application of arc welding, by discovering an electrode coating having the fusion point and viscosity easily adjustable to a wide range of conditions and the composition of the metals being welded. They have also given special attention to the problem of welding and depositing special steels, and now possess a process suitable for repairing and reinforcing articles of high tensile and special steels.

Of particular interest to tramway engineers is the suitability of the "A. W. P." system of arc welding for permanent way repairs, repairing rolling stock equipment, gear cases, truck frames, axles and armature spindles, motor carcases and end plates, brake gear, gear wheels, running wheels, and body fittings. Experience has shown that arc welding, if properly applied, can replace worn parts and reunite broken pieces so effectively as to make them, to use the old phrase, "as good as new." At any time, such an addition to the economical resources of tramway engineers would have been welcomed, but in these days it has become a greatly desired boon. While it can hardly be claimed that welding will actually restore tramway rails which have become broken and worn, to their pristine strength, the process undoubtedly renews the worn rails, and gives them a longer efficient life than would be possible otherwise. In parts subjected to less severe wear, the welds effected by the electric arc processes actually renew the structure. It is confidently stated that, since the adoption of "A. W. P." electric welding, some tramway engineers have found it unnecessary to replace worn or fractured horn plates, axle boxes, grease box covers, brake hangers, motor suspension rackets, and other such fittings.

The installation of a complete outfit for carrying out the "A. W. P." process of electric welding is very simple, and costs comparatively little. The firm undertakes to supply motor generators and transformer sets, as portable or fixed equipments, and for any conditions of electric supply.

RAILLESS TRACTION SCHEMES FOR NEWPORT.

Mr. A. Nichols Moore, borough electrical and tramways engineer of Newport, has presented a report to the Electricity and Tramways Committee on the introduction of railless traction on certain routes in the district. The first suggestion dealt with is a proposed railless service between the tramway terminus in Corporation Road and the Channel Dry Docks, as suggested by Councillor Peter Wright, providing a circular route, and the second for a line between Caerleon Road and Chepstow Road, as proposed by Councillor W. E. Robertson. The length of the former would be approximately one mile, and the construction would involve the erection of two overhead trolley lines, together with feeder cable extensions for providing the supply, at an approximate cost of £3,000. Six cars would be required at an estimated cost of £12,000. As regards maintenance, Mr. Moore says that while railless traction compares favourably with ordinary motor omnibuses, the maintenance charges are higher than for a tramway service. The six cars would provide accommodation for approximately 240 passengers, but this is only one half of the estimated traffic that would have to be dealt with between Corporation Road and the Channel Dry Docks.

The total length of the route involved in the second proposal is one and a half miles, and the estimated cost of the overhead equipment £4,300. Cable extensions will be necessary, and the estimated cost of these is £2,700, which will be increased by another £2,000 if it be found necessary to provide a negative return feeder cable. A 15 minutes' service is suggested, and this would require three cars, with one as a spare. The estimated cost of these vehicles is £6,000. There are some exceptionally steep gradients on the route, and the engineer considers it is by no means a good route for railless traction. Estimates for the overhead work, which do not provide for engineers' contingencies or for additional car shed accommodation, are based on side-pole construction with four trolley wires.

After a discussion, the Tramways Committee decided that the only practical solution to the question of the suggested service from Corporation Road to the Channel Dry Docks was to place the scheme before Messrs. Mawdey, Carney and Company and the Channel Dry Docks Company, and to ask for suggestions and some idea as to what their contribution towards the cost of such an undertaking would be.

PROPOSED PURCHASE OF GREENOCK TRAMWAYS.

The purchase of the Greenock and Port Glasgow tramways was considered at a special meeting of Greenock Corporation on September 1, and after a long discussion it was decided to postpone a decision on the question until an inquiry had been made by the Tramways Committee. Provost M'Millan explained that some months ago Mr. W. L. Madgen, chairman of the company, had placed before the Tramways Committee a proposal of the tramways company that Greenock as an individual body, or in conjunction with the towns of Gourock and Port Glasgow, should purchase the undertaking at a price fixed by the Act of Parliament at the break in the lease in 1921. The Corporation would not be required to find cash so far as the Greenock portion of the line was concerned, as the tramway company were prepared to accept stock or mortgage at a reasonable rate of interest, say half per cent. above what the Government would pay. It was thought advisable to get further information, and the Provost moved that the matter be remitted to the Tramways Committee, who might call in expert advice if thought desirable, and consult Gourock and Port Glasgow, and also find out if there was a better method of transport than tramways. The Provost's motion was eventually adopted by 15 votes to 2.

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ELIMINATION OF THE CONDUCTOR.

Popularity of One-man Cars in America and Canada.

At the midsummer meeting of the Central Electric Railway Association, U.S.A., Mr. S. W. Greenland, general manager, Fort Wayne and Northern Indiana Traction Company, presented a paper on "One-man Car Operation."

At the present time, the author said, there are 102 cities and towns in the U.S.A. and Canada where there are being used 1,164 one-man cars of all descriptions. This number has increased rapidly during the past two years on account of the conditions through which our industry has passed, and surely we are entitled and expect to profit by this experience, and undoubtedly the one-man car is one of the good things coming to the industry out of this experience.

The development of the art has brought the prepayment type of car, the light-weight motor, the fare-box, the low or stepless car, and the elimination of the conductor. If these are combined with the light-weight body and truck construction, we have the modern one-man car, so that the development has been step by step.

Adaptability to All Communities.

There does not seem to be any limit as to the use of the one-man car, so far as the population of a community is concerned. Probably the smallest community in which this type of car is being used at present is Columbus, Indiana, where five cars are serving a population of 3,000. The largest city in which they are being used extensively is Spokane, Washington, where eighty-five cars are operated to serve a population of 135,000. The one-man car is not a "cure-all," or a car that can be operated under absolutely all conditions. There are, however, lines in almost every community where its adoption and use will improve service, and thus better serve the public. Local conditions exist with all companies, which at times we feel cannot be changed, but in reality a number of these can be changed if we will but adopt the slogan of the American expeditionary forces, which is, "It can't be done, but here it is."

It is interesting to find that the following companies have been operating one-man cars for more than ten years:—East St. Louis and Suburban Railway Company, Beaver Falls Traction Company, Hattiesburg Traction Company, Ownesburg City Railroad Company, Salina Street Railway Company. These companies have not had the latest type of one-man car, but have been operating the regular single truck car, designed in such a way that the entire operation is in charge of one man. The general average of ninety-eight companies in the country show they have operated one-man cars about three years.

Type of Cars and Power Consumption.

There are in service as one-man operated cars three different classes:—The converted car, the Birney car, and other one-man designed cars. In the converted car the saving is in the operators' wages. In the Birney car the saving is in the reduction of power consumed as well as operators' wages. In the other type of one-man cars the savings are the same as in the Birney cars, and in addition to these savings the comfort and convenience of the passengers are very much improved. The above comparison is based on the converted cars being equipped with platform doors, which have reduced the number of boarding and alighting accidents.

The question of power consumption has been one of the principal items considered. The current consumption varies with the weight of the car. Some interesting information has been obtained in a typical middle west city, where several types of single truck cars are being operated. The current consumption was taken at the car, and includes only the current used for motors and compressors; the readings obtained were as follow:—

Weight of Car.	Motors.	Average K.W.H. per Car Mile.
26,900 lb. ...	2-40 H.P. ...	2·32
21,000 lb. ...	2-25 H.P. ...	1·30
13,500 lb. ...	2-25 H.P. ...	1·05

The average reduction in current consumption by all companies using the Birney type of car in the country was 51·2 per cent. On the converted type of car the question of current consumption remains the same as when the car was operated by two men. In some cases this consumption has been increased, as cars have been equipped with air-brakes in order to reduce further the work of the motorman.

Operators' Wages: Conductors the Best Operators.

The rate of pay to trainmen for the operation of the one-man cars differs very considerably throughout the country. A number of companies do not pay any additional amount for one-man operation; other companies pay an additional amount per hour, ranging from 2 to 10 cents. Some companies have found it advisable to place this question on a percentage basis ranging from 10 to 30 per cent. of the existing rate. This is a matter governed entirely by local conditions, but inasmuch as additional duties have been placed on the operator, it naturally follows that some increase in pay should be granted. Furthermore, it is the opinion of the author that it will be necessary to have a higher grade of operators on the one-man cars if they are to be operated properly and to the satisfaction of the public.

It has been found in a great many instances that a conductor develops into a more efficient operator than a motorman, this being on account of the conductor having had the general experience of dealing with the public, making change and issuing transfers; therefore it is only necessary for him to learn to operate the car physically, while with the motorman it is necessary for him to learn to collect fares promptly, issue transfers, make change, and also to deal courteously with the public. This, of course, does not hold good in all cases.

Revision of Schedules.

With the placing in service of one-man cars, it has been necessary, in a great many instances, to revise the former schedules. In reports from 94 companies, 64 companies have not increased the number of cars operated; 20 companies have. Of the companies making an increase in their schedule, it has averaged 50 per cent. Some of the increases, however, have been very much more, and in a number of cases the increases have been caused in schedules of 15 to 20 minutes. It undoubtedly is necessary in most cases to increase schedules and furnish more frequent service if the full advantage of the one-man car is to be realised. During these days, when the automobile is so generally used, more frequent service will, to a certain extent, be justified, in that the operation of the one-man car so materially reduces the operating expense.

Earnings.

Reports from 43 companies show that they have had an increase in earnings from the operation of one-man cars, while 35 companies report that their earnings have not been affected either way by such operation. It seems to be invariably true that where the converted cars have been used there has been very little, if any, increase in earnings. The greatest increase in earnings are shown where the new type of car has been placed in service. I do not believe this is to be wondered at when you consider the view point of the public. In most cases the cars that have been converted still retain the same general appearance, with the undesirable longitudinal seats, high steps, and practically the only thing that has been done has been to instal additional doors and possibly air-brakes, and otherwise the car remains the same. With the new type of car the public is immediately impressed on account of the low step, cross seats, and all of the other items of improvement that have been installed, and while this may be a purely psychological effect, the increase in earnings, as shown by the companies operating the new design of car, surely justifies the adoption of the new type of car.

Accidents and Maintenance Cost.

Where the platforms have been protected by doors in the past, the reduction in accidents due to the introduction of the one-man car has not been material. Surely with the loading and unloading of passengers under the supervision of one man the operator should reduce to the minimum the boarding, alighting, and platform accidents. Collisions with automobiles and other vehicular traffic have been somewhat reduced on account of the lighter car being under better control.

On the question of cost of maintenance, both on cars and track, very little information is available, and any information obtained from the operating companies is largely an estimate on the part of the officials; however, with the reduction in weight, there undoubtedly will be less track maintenance. So far as I have been able to learn, no operating company has attempted to construct its track for the special operation of the lighter cars. This undoubtedly will be done in the extending of present tracks and in rebuilding, for the one-man car has come to stay, and therefore the change in the design of track construction will follow, as lighter rails and lighter track foundations will surely stand up under the lighter cars.

In the total of 102 companies now operating the 1,164 one-man cars, there are in service 620 converted cars, 443 Birney cars, and 113 other one-man cars, so that more than 50 per cent. of the present cars operated are of the converted type. This undoubtedly is due in many cases to the inability of the operating companies to secure new cars.

The newly-designed car was built in some instances with a total weight of 10,000 lbs. The standard Birney car to-day weighs 13,500 lb. On specifications recently prepared by one of the larger eastern companies for one-man cars, the weight has been placed at 16,000 lb. From the experience we have had on our system, where 25 of these newer cars have been operated, it is the author's opinion that a reasonable weight would be approximately 18,000 lb. This weight, the electric companies furnishing the motors have agreed, is the maximum to be handled by their present design of motor. If this weight is assumed, it will permit of a sufficiently large platform to provide both entrance and exit doors at the front; will provide a double floor; comfortable seats of reasonable width, and an aisle of sufficient width. While it will require more current to operate this car, the difference in current consumption will not be material when the question of public comfort and convenience is considered. It therefore may be necessary, in the establishment of a standard car, to have cars of two weights.

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ALUMINIUM—THE ELECTRICAL METAL.

A Paper Read at the Electrical Club of Montreal by Ernest O. Pannell.

To both France and America belongs the credit for evolving the only practical means for producing aluminium, and in both countries the production has been continually increased. The aluminium is reduced from an ore which is known as Bauxite, from the little town of Baux in the French Pyrenees, where it was first worked. The first thing which occurs to us in connection with the reduction of an ore is simply "Smelt it." Why introduce this costly and troublesome electrical process? Well, that is just what the early experimenters thought about it. Now when an ore is smelted the oxygen combined with the metal has to be separated. This can only be done by introducing some other agent with which the oxygen can readily combine. In many instances a typical reducing agent is carbon in the shape of coal or coke. Iron ore, for instance, is loaded into a blast furnace with coal and coke, and the result yields metallic iron and carbon dioxide. Now what happens if we load up a furnace with aluminium ore and attempt to do the same thing? Simply this, that the aluminium will be no sooner reduced from the oxide than it forms a compound with the carbon and we are worse off than we were before. The fact is that aluminium is so ready to combine with other elements that it cannot be isolated in this way at all.

It would be tedious to go into the chemistry of the matter in detail, but the only practical means found for reducing aluminium was to use an electrolytic process in which the metal would not tend to combine with the carbon of the electrodes. At the same time the temperature of the bath must be around 900 deg. C., so that the electric current has not only to deposit the aluminium from the electrolyte to the bottom of the tank, but has also to keep the whole mixture in a molten condition.

In actual practice the operations are more detailed than this. For one thing the ore has to be refined before it is available for the electrolytic furnace, and there are different means of effecting this. In general, however, the process followed at the present day is substantially that of Heroult and Hall. Water power is, of course, essential to the production of electrical energy in such large and continuous quantities as are used in aluminium production and some of the greatest water powers in Europe and America are employed in supplying an aluminium reduction load. It may, therefore, be called an electrical metal not only with regard to its uses but to its production.

8,000-Fold Increase in Production.

While speaking of production it is interesting to compare the output of aluminium at the present time with that of only 30 years ago. In 1889, 47,000 lb. or about one carload was produced. In 1917 the world's estimated production exceeded 382,000,000 lb. and would require a train of 8,000 cars, a train nearly 90 miles long, to load it. Needless to say, this increase of 8,000-fold in 30 years is far ahead of any other metal and proves that specific uses have been found for aluminium in which it is a strong competitor of the older metals.

To a great extent the production has been accelerated by the war; indeed the present output is much greater than in 1914. Many hundred tons of aluminium sheets have been used in the construction of aeroplane fuselages and in the structure of airships. Other applications have been for the manufacture of canteens and field utensils, binoculars and instruments, also bullet tips, shell fuses, and not least as an explosive. It is interesting to note that many miles of scrap aluminium wire taken down from a transmission line near Montreal were unstranded, straightened, drawn and headed into bullet tips, which were afterwards turned to good purpose. Similarly considerable quantities of scrap material were turned into powder for use as an explosive. As we have already seen, aluminium oxide is very difficult to reduce to the metal; conversely aluminium in a finely divided form is oxidised very readily and in combination with an oxidising agent the action takes place with violence. It is only necessary to bring together aluminium powder with ammonium nitrate and to ignite them with a special detonator to produce an explosion. The same action slightly modified is used in the well-known Thermit process, in which this oxidation of a small quantity of aluminium after once being started by a cartridge generates sufficient heat to melt the iron contained in the crucible.

The Manufacture of Aluminium Wire.

It will be interesting to follow briefly the operations in the production of electric wire and cable in which aluminium is becoming so widely used at the present time. The metal leaves the electrolytic furnace in the shape of a block. These blocks or pigs are all analysed and graded according to purity. In order to secure the necessary conductance a purity of well over 99 per cent. must be attained and lower percentages, although they yield metal which is actually better for some kinds of work, are not passed for the wire mill. Next the metal is remelted to enable it to be cast into shape for rolling. There are many different forms of wire billets depending upon the requirements of the mill where they are to be rolled; the larger mills will, of course, take billets 5 in. square or larger, whereas smaller mills will probably specify the bars to be 2 in. or 3 in. Needless to say, the best material is produced by rolling down the largest possible billet which the capacity of the mill will permit.

It is usual to roll square billets rather than round, because the former shape will be worked up more thoroughly and will give wire of greater tenacity. A typical wire bar into which the metal is cast is 4 in. square and weighs 84 lb. This is broken down and run down hot through a great many passes, the material changing its shape continually while rolling so as to be thoroughly worked. It finally emerges as a rod $\frac{3}{8}$ in. diameter and about 650 ft. long, ready for drawing. Operations in the wire mill are similar to those on copper. However, the aluminium rods have the peculiarity of being free from scale and do not have to be tumbled. Furthermore, it is possible to draw aluminium nearly three times as far as copper without having to anneal it. The reductions correspond to the numbers on the B. & S. scale and the speed depends upon the tensile qualities required in the finished product. Since aluminium is much more flexible than copper it is usual to strand up wires of larger diameter, and the sizes stranded are from 10 to 16 B. & S. on the average. The finished wire is tested for conductance when drawn. Now the conductance of a unit cube of aluminium will vary from 58 to 62 per cent. of that of standard annealed copper in the same size and is, of course, dependent on the temper of the wire. Very soft aluminium will be higher than 62 per cent. and very hard wire only about 58 per cent. It stands to reason then that there is no such thing as standard conductivity unless the tensile strength of the wire is also defined, as well as the size, but it is sufficient to adopt the usual figure of 60 per cent., with a tensile strength of 24,000 lb. per sq. in. If we are going to replace a copper wire on an overhead line with an aluminium conductor, the latter will be nearly 66 per cent. larger in area and 29 per cent. greater in diameter. In other words, it will be nearly two numbers lower on the B. & S. scale, so that a No. 10 B. & S. copper wire would be replaced with a No. 8 aluminium.

Aluminium cables are stranded and reeled just like copper; they are naturally easier to handle during erection because of the lighter weight and greater flexibility. There is one disadvantage, however. When aluminium cables are strung on a long span tower line in the same way as copper they will be found to sag from 25 per cent. to 50 per cent. more, owing to the fact that they cannot be pulled up as tightly. This factor has had little effect in climates where sleet loading does not have to be allowed for, but in the northern United States and in Canada the extra sag on aluminium lines has led to the use of higher and more expensive towers. This has sometimes led to the economy effected by using aluminium instead of copper being entirely eliminated due to the extra steel.

For a long period experiments were made to determine means for the production of a conductor which would sag less than aluminium. In the first place the metal was very carefully rolled and drawn, so that the tensile strength instead of being 24,000 lb. per sq. in. was as high in some cases as 35,000 lb. This, however, meant costly manufacturing operations and lower conductance. Then alloys of aluminium with copper and aluminium with nickel were tried out. These alloys yielded a tensile strength as great as copper, but the conductance was very much lower than pure aluminium and a greater disadvantage was found in the deterioration which took place after exposure to the weather. Next the success which attended the use of copper-clad steel wire induced the manufacturers to experiment in the casting of a compound aluminium-steel billet and rolling and drawing down the compound wire. Unfortunately this did not work out as satisfactorily with aluminium as with copper. In the meantime, however, tests had been made on a cable consisting of aluminium strands laid around a core of steel wires. This type of conductor had a period of trial in one or two installations on the Pacific Coast for several years before it was advertised, and in every way its durability was thoroughly proved. Aluminium-steel conductors are now the standard form of cable for long span high tension lines.

At first it was believed that the combination of aluminium and steel would lead to considerable trouble. It was thought that there might be corrosion between the two metals due to the ingress of moisture. However, this has not been reported. The steel wires are always double galvanised and impregnated with fish oil. Now the zinc coating on the steel works very well in contact with aluminium, because it will be found from a chemical table that the two metals are very nearly the same in the positive series; in other words, there will be little or no galvanic action between them even in the presence of moisture. Another objection which was urged was that with increasing temperature the aluminium would expand faster than the steel and would tend to open up the cable in bird-cage fashion; this also has been found to be a mistake. As a matter of fact, when properly dead-ended the two metals will expand and contract exactly the same as each other, and will share the load between them so that there is no relative movement.

So the net effect is as follows: we obtain a conductor which is about 35 per cent. heavier than aluminium and costs 4 or 5 per cent. more. But it will have a sag on long spans of 50 per cent. less;

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in other words, the towers will be from 10 to 30 ft. shorter and a corresponding quantity of steel will be saved from the line construction. The cables can be strung tightly with short crossarms and a minimum risk of swinging together.

USED FOR SWITCHBOARD WORK.

Since many thousand tons of aluminium have been used for overhead transmission it is not surprising to find that the metal has also been employed in other directions as an electrical conductor. For instance, in England there are many instances of sub-station busbars and switch connections being installed in the light metal. Here a new aspect presents itself. It is not the drop in volts which determines the size but the temperature rise. Now we have already seen that aluminium has a 30 per cent. greater diameter than the same conductance of copper; in other words, it has a 30 per cent. greater surface to radiate heat. So that the temperature rise will be lower, or alternatively for the same temperature rise a smaller conductor can be used. Following this out we find that for switchboard work one pound of aluminium goes nearly as far as two and a half pounds of copper.

A special application of aluminium may be here mentioned, that is, in the form of round rod connections for battery rooms. Sulphuric acid vapour is one of the agents which have very little detrimental effect on the metal; several battery rooms have, therefore, been connected up with aluminium throughout and give very good service. The great advantage in the use of round rod is that it can be butt welded. All that is necessary is to square up the two ends of the rod which are to be jointed and face them together in the flame of a gas torch. In a minute or two the metal will begin to soften and the ends are then firmly pressed into contact; the action squeezes out the oxide and a perfect joint with 100 per cent. conductance is the result. The same process is used with wire and many other forms of the metal, but it should be remembered it is not permissible for cables to be used for overhead work, because the joint in the wire will be annealed and not stand up to the same stress as the rest of the cable.

When operating voltages rose from 60,000 to 100,000 and then to 150,000 volts, a trouble arose which soon began to be a serious operating problem. I allude to the phenomenon of corona discharge. In a few words it may be expressed as the breakdown of the air as an insulator and the production of a discharge from the wire, leading to a definite loss of energy. This discharge will take place at a higher or lower voltage according to certain conditions, chief of which is the size of the wire. The smaller the wire the lower will be the corona voltage. Now if the corona voltage is lower than the operating pressure there will be a loss of energy and some artificial means may be necessary to raise the corona voltage. This is done automatically by the use of aluminium, and while there might be a considerable corona with a copper wire, it will probably be found that the 30 per cent. greater size of the aluminium will eliminate the corona altogether. This is generally regarded as being a matter affecting only high tension lines but it also enters into switchboard connections and insulated cables.

There are many engineers who have been accustomed to look upon aluminium as a perfectly good material for an overhead cable, but who imagine that the metal cannot possibly be adopted for underground work for economic reasons. Now as a matter of fact aluminium cables have been employed for underground insulated work, not only for low voltages but for transmission work running into 30,000 volts. Aluminium is found to give good results for two different reasons. In the first place on low tension cables, such as are largely used in Europe for street railway feeders underground, the section of metal is large and the insulation, usually paper with a lead sheath or bitumen, is not very costly. In this case it has often been found that the insulated aluminium cable, complete, is as much as 12½ per cent. cheaper than copper. Again, when very high voltages are considered the larger size of the aluminium core leads to a lower potential gradient in the dielectric, which is practically the corona limitation coming in again. In other words, less insulation is required for this larger core and the cable is again cheaper.

It is not necessary to say very much more to demonstrate that aluminium is worth the consideration of every electrical engineer, but, of course, it must be brought into comparison with copper in every specific case to show just whether it is an economic proposition. In earlier days it was objected that the supply was too uncertain to figure upon, but at the present time when production of the white metal is 400,000,000 lb. per year this objection has no weight.

Need for Car Jacks.—At an inquest held in Tynemouth on the body of a woman killed by being run over by a tramcar, evidence showed that the deceased had deliberately thrown herself in front of the car. It was with difficulty the body was extricated from under the car, and the jury asked why jacks were not carried on the cars. A verdict of "suicide while of unsound mind" was returned, a rider being added to the effect that the tramway company should make provision for such appliances as would be serviceable in cases of similar accident.

THE GOVERNMENT'S PROGRAMME.

THE PRIME MINISTER INVITES THE COUNTRY TO DISCUSS ITS INDUSTRIAL AND TRADE PROPOSALS.

Mr. Lloyd George, the Prime Minister, on August 21, issued the following letter to the Press:—

The numerous decisions of the Government announced by me to the House of Commons on Monday have to some extent been obscured by the discussion of one or two highly controversial points with which I had to deal, which, though important, bear only upon a small portion of the Government programme. Perhaps this was inevitable. There remain, however, a large number of matters which are of vital concern to the country, and deserve full discussion before Parliament is asked to pass legislation to deal with them.

The statement referred to by the Prime Minister is of such importance to the country, and to its manufacturing interests in particular, that it needs no introductory emphasis:—

A.—LABOUR.

1. *Wages and Hours.*—A Bill has just been introduced dealing with hours and wages based upon recommendations of the Joint Committee of the National Industrial Conference. The principles of this Bill are (*a*) the establishment of a national maximum working week of 48 hours, except in certain industries with special conditions, such as agriculture, the merchant marine, domestic and outdoor service; (*b*) the establishment of a living wage throughout industry.

2. *Conditions of Work, Sharing in Profits, and Unemployment.*—There are three aims, which the Government are anxious to see achieved, viz.:—

(*a*) The promotion of a larger degree of co-operation between workmen and employers in the determination of working conditions, and in this connection the development of the system of Whitley Committees.

(*b*) Securing to the workers more generally a financial interest in the success of the industry in which they work.

(*c*) Adequate provision for and satisfactory arrangements regarding unemployment.

The Government would prefer to deal with the question of unemployment on the basis of agreed recommendations by the Joint Committee of the National Industrial Conference, who have so far failed to agree on any proposals. Failing such agreement it may become the duty of the Government to put forward proposals in the name of the whole community.

3. *Housing.*—Three Acts passed by the present Parliament—the Housing Act, the Land Acquisition Act, and the Ministry of Transport Act—will in combination provide the means of dealing with the problem of housing along proper lines, by the creation of houses outside congested cities and the provision of transport facilities to bring the workers to and from their work.

B.—COAL MINES.

4. *State Purchase of Mineral Rights.*—The Government accept the policy of State purchase of mineral rights in coal, on which the reports of the Coal Commission (Second Stage) are unanimous.

As part of the scheme for the purchase of these rights a levy will be made upon the compensation to be paid. The proceeds of this levy will form a fund for the amelioration of the social conditions of miners. In the case of Scotland account will be taken of the fact that a rate levy on receipts of mineral values exists in that country.

5. *Fund for Amelioration of Social Conditions of Miners.*—The Government have been deeply impressed by the evidence which has been tendered to the Coal Commission with respect to the unsatisfactory social conditions under which, in some parts of the country, miners are compelled to carry on their industry. A reasonable standard of living should be secured to the miners and their families; the deplorable housing conditions now prevailing in some of the coalfields of the country must be remedied without delay; and every effort must be made to improve the comfort and amenities of the industry. Consequently the fund to which allusion has been made will enable these defects to be repaired on a comprehensive plan.

6. *Co-operation with Labour in Determining Working Conditions.*—In view of the facts that the lives and livelihood of the miners depend on the way in which the mines are worked, means have to be devised for securing their co-operation in the shaping of the general conditions of the industry without interfering with the executive control of individual mines.

7. *Organisation of the Industry.*—The Government, after careful examination of all the reports of the Coal Commission and the evidence given before it, have come to the conclusion that they would not be justified in undertaking the State purchase and State management of collieries; and apart from any question of the desirability or otherwise of the nationalisation of the coalmines, the financial burden on the country, having regard to other essential obligations on the State, is in itself such as to preclude its adoption.

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In the national interest, however, the industry will have to be so organised as to reduce to a minimum the expenses of management and working charges. With this end in view, the country will be divided into convenient areas, in each of which an amalgamation of neighbouring mines will be undertaken within a limited period; subject to the condition that the Government have power to veto or modify any scheme of amalgamation which is detrimental to the public interest, as also to protect the general body of consumers from possible exploitation by the coal industry.

Any scheme of reorganisation would be defective which failed to furnish coal in such quantities and at such a cost as to enable the export trade of the country to be maintained and extended.

8. *Representation of Labour on Area Boards.*—The Government propose that all workers in and about the mines should have a direct voice on the Board controlling the policy of the Area Group of Coalmines. Further, the status of each representative of the workers on this Board should be in all respects equal to that of the other members.

9. *Provision of Opportunities.*—The industry, both on its industrial and its educational side, should be so organised as to offer a free career to talent and to give to every member concerned in it, in whatever grade of employment, opportunities of improving his abilities and his position.

10. *Committee on Output.*—In accordance with the unanimous recommendation of the Coal Commission a committee will immediately be set up to inquire into the diminution of output in the coalmines.

The Government propose to prepare a scheme on the above lines at once and submit it to Parliament with the least possible delay.

C.—TRADE POLICY.

11. *Import Restrictions.*—The interim policy of import restrictions established for the purpose of shielding British industries against foreign competition during the transition period will come definitely to an end on September 1, existing restrictions being then withdrawn except as indicated below.

12. *Foreign Exchanges.*—Government support of the exchanges will be abandoned, except in so far as some support may for a time be necessary to prevent complete collapse of any important exchanges.

13. *Dumping of Goods of Foreign Origin.*—Legislation will be introduced for the protection of goods manufactured in Great Britain and Ireland against dumping. Power will be taken to prevent the sale in this country of similar goods beneath their price in the country of origin.

14. *Power to Check any Excessive Influx of Goods Consequent upon a Collapse of Exchange.*—The Government will seek emergency powers to enable the Board of Trade to check any flood of imports (for instance, from Germany) that might arise from a collapse of exchange so disproportionate to costs of production in the country of origin as to enable sales to take place in this country at prices altogether below costs of production here.

15. *Protection of Unstable "Key" Industries.*—The Government will also seek powers from Parliament to prohibit the import except on licence and on payment of a licence fee of the products of key industries which are in an unstable position in this country. Industries which fulfil the following tests will alone be regarded as "unstable key" industries for this purpose:—

(*a*) That the product is essential for war or for the maintenance of the country during war.
(*b*) That the industry had been so neglected before the war that there was an inadequate supply of the product.
(*c*) That the industry is one for the fostering and promotion of which the Government found it necessary to take special steps during the war.
(*d*) That if special Government support were withdrawn, the industry could not maintain itself at the level of production essential to the national life.

It is proposed that the fees charged for the issue of licences to import goods produced by such "unstable key" industries will be fixed with regard in each case to the difference between the price at which the article can be imported and the price at which similar articles can be sold in the United Kingdom. It may be necessary for some years for the Government to continue to assist these industries. Care will be taken that no undue profits shall be made at the expense of the community. Pending the grant by Parliament of the necessary powers to give full effect to this policy, the Government intend to continue the existing import restrictions which affect industries qualified to be regarded as unstable key industries. These will be scheduled, and the schedule published at an early date.

16. *Technical Instruction and Research.*—Steps will be taken to increase efficiency by encouraging and developing technical education both for managers and workpeople. Further efforts will also be made along the general lines already laid down to promote industrial research and invention.

17. *Promotion of Increased Output.*—Inquiry and propaganda with this end in view will be undertaken.

18. *Standardisation.*—There is growing recognition of the importance for the future of British industry of the principle and practice of standardisation, but so far the State has done little. It is proposed to set up at the Board of Trade a department of Standards (1) to promote and co-ordinate standardisation generally, and (2) to establish and administer such testing institutions as may be found necessary, and authorise, and so far as may be required supervise, the testing work carried out by technical institutions, trade organisations, or private concerns.

19. *Power Supply.*—The policy of the Government with regard to electric power is embodied in a Bill now before Parliament. During the autumn session another Bill will be submitted dealing with the control and development of water power.

20. *Fostering Imperial Trade.*—On a resolution of the Imperial War Conference an Imperial Investigation Board is being constituted, representing the British Government and the Dominions, together with shipping and commercial representatives, to inquire into and report on all matters connected with ocean freights and facilities, and the development and improvement of the sea communications between different parts of the Empire, with special reference to the size and type of ships and the capacities of harbours.

The Government also aims at developing Imperial supplies. Much work in this direction has been commenced during the war.

21. *Export Credits.*—Steps are being taken to establish a system of export credits for the purpose of facilitating a resumption of the export trade to disorganised parts of Eastern Europe, e.g., Serbia, Roumania, Poland, and parts of Austria. In case of loss the drawer of the bill is guaranteed to the extent of four-fifths of the difference between the proceeds of the bill and the prime cost plus freight, plus insurance (including the charge made by the office). Credits will be furnished to the extent of £26,000,000 in the aggregate.

22. *Promotion of Exports Generally.*—The Government will endeavour through the Consular and Commercial Attache Services to stimulate the export trade in every direction.

23. *Agriculture.*—A Commission is sitting to examine and report as to the minimum prices to be fixed for the purchase of the crops next year. But as it can hardly report for some weeks and the farmers are now making their plans for next year's crops the Government are prepared now to undertake to continue for another year at any rate prices approximately the same as those obtained up to the present.

24. *Protection Against Harmful Combination.*—With a view to protecting the public against any harmful effects of trusts and trade combinations, the Government require powers of inquiry as a preliminary to taking action in time if action should become advisable. Powers have already been obtained under the Profiteering Act for a period of six months, but as announced in the House of Commons the Government intend to introduce legislation in the autumn designed to secure powers of a more complete and more adequate nature.

25. *Statistics and Information.*—The Government intend to collect fuller information about production, trade, prices, costs, and profits than has hitherto been obtained, and to seek any powers that may be requisite.

INCREASING AMERICAN TRAMWAY FARES.

A large number of American tramway companies are obtaining authority from the local State Legislatures and other governing bodies to increase their fares. Owing to present conditions the 2½d. universal fare has in many cases become impracticable, and many of the companies are faced with serious financial difficulties. Among the undertakings recently given a concession on this account is the Kansas City Railways. For one year from August 20 they are authorised to charge a fare of 8 cents (just over 4d.), but two tickets will be sold for 15 cents, seven for 50 cents, and 50 tickets for $3.50. Although the State Railway Commission has authorised the increase, the city officials will oppose the advance, although it is unlikely that the opposition will meet with success. The Commission estimate that the increased fares will enable the company to earn 4·8 per cent. per annum for depreciation and interest on the bare value of the property. The order allowing the increase in fares also requires the company to increase the service by 100 cars. The Commission found that "immediate relief is necessary to save the company from bankruptcy."

STANDING PASSENGERS IN LONDON VEHICLES.

In the House of Commons, on August 19, Mr. Gilbert asked the Home Secretary whether he could state for how long a period it was proposed to continue the permission granted by the Metropolitan Police to tramway and motor omnibus undertakings to carry over the number of licensed passengers on tramcars and omnibuses plying in the Metropolitan area?

Mr. Shortt replied that it was not possible at present to say for how long a period this permission would be continued. It would necessarily depend on the number of vehicles available. Up to the present the output of new vehicles had been small, but a new type of omnibus had been approved, and it was anticipated that a start will be made to turn out a number of new vehicles in the near future.

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MINISTRY OF TRANSPORT'S ADVISORY COMMITTEE ON LONDON TRAFFIC.

The Ministry of Transport Act, 1919, received the Royal Assent on August 21, and Sir Eric Geddes, the Minister on whom rests the responsibility of the organisation of the great department of State which will administer the new Act, has taken up his headquarters at the old Board of Trade offices at Whitehall Gardens, S.W., where schemes of the greatest importance are being elaborated. One of the Minister's first acts was to address a letter to the chairmen of the County Councils of London, Middlesex, Kent, Surrey, Essex, and Hertford, asking each Council to appoint a nominee to an Advisory Committee to be set up under the Transport Act. The committee is not intended to interfere with the proposal of the Parliamentary Committee on London Transport that a separate traffic authority be appointed to deal with the whole subject of London transport.

As matters stand at present the powers of the Transport Ministry are circumscribed. The situation is, in fact, complicated, and indicates some of the practical problems which the Ministry will be called upon to solve. Municipal tramway undertakings are expressly excluded from the control of the Ministry by the Transport Act, but the measure gives power to acquire possession of company tramway and light railway enterprises, and confers authority on the Ministry to compel adjoining tramway systems, whether owned by local authorities or companies, to exchange running powers. The question whether or not an effort should be made to simplify the situation by obtaining further powers for the Ministry is one for the proposed Advisory Committee to consider.

SELECT COMMITTEE ON LONDON TRAFFIC.

Before the House of Commons adjourned Mr. Bonar Law stated that the Government had not yet come to any decision as to the action to be taken on the report of the Select Committee on London Traffic. They hoped, however, to carry out some of the recommendations. In reply to a question by Mr. Kennedy Jones, who asked if Mr. Bonar Law was aware that it was specifically laid down in the report that the congestion in the coming winter was likely to be much greater than at present, and if he did not think it advisable to deal with the congestion as rapidly as possible, Mr. Law said that he agreed with the suggestion.

EVIDENCE AT THE PARLIAMENTARY ENQUIRY.

In our issue of August 14 we gave a full summary of the report of the Select Committee of the House of Commons on Transport (Metropolitan Area). As indicated in that issue, the character of the report is such that no surprise will be felt that the Government have as yet taken no action on its recommendations, although, as reported above, Mr. Bonar Law has stated that the Government hope to carry out some of them.

In the meantime it may be useful to record in these pages a connected summary of the interesting and important evidence that was given before the Committee by various witnesses, several of whom are actively concerned in London transport undertakings, and spoke with the authority of long experience and fullest knowledge of the conditions. The whole problem is of enormous complexity, and bristles with difficulties which the Committee in their report seem but inadequately to comprehend.

The Committee, over which Mr. Kennedy Jones presided, began its sittings just before the Parliamentary Whitsuntide recess, and continued to take evidence while Parliament was not in session. This unusual course was followed because the question was said to be urgent. So far as congestion is concerned the urgency has been apparent for many years. Moreover, though there have been many inquiries, culminating in the Royal Commission of 1905, nothing has ever been done to ameliorate the trouble.

POLICE DEPARTMENT EVIDENCE.

At the first sitting for the hearing of evidence on June 5, Superintendent Arthur Bassom, public carriage branch of Scotland Yard, was the first witness. He said that at the end of last year the number of motor omnibuses licensed was 2,277. Quite a number of these would be off the streets at a time for overhaul. In 1914 the number of motor omnibuses licensed was 3,057. Over 160 new omnibuses had been licensed this year. In regard to the volume of street traffic passing given points, in 1904 a general enumeration was taken at 18 selected traffic points for the purpose of the Royal Commission on Traffic. In that year 291,930 vehicles passed within twelve hours. In 1912 another general census was taken, and at the same points and during a similar period 437,555 passed. In 1915 another census gave 378,471 vehicles passing those points. The greatest number occurred at Hyde Park Corner, where, in 1912, during twelve hours, 41,106 vehicles were counted. The second highest was at Piccadilly Circus, where the number was 39,322. The figures for the other points were :—Trafalgar Square, 34,895 ; Marble Arch, 31,927 ; Albert Gate, 28,620 ; Oxford Circus, 27,310 ; Piccadilly (St. James's Street), 27,125 ; Oxford Street (Tottenham Court Road), 24,479 ; High Holborn (Southampton Row), 24,286 ; the Elephant, 20,782 ; Whitechapel Road, 19,498 ; Vauxhall Cross, 19,035 ; Blackfriars Bridge, 18,980 ; Gray's Inn Road (Theobald's Road), 17,822 ; Kensington High Street, 16,989 ; Old Street, 16,002 ; London Bridge (south side), 15,850 ; Aldgate, 13,425. In 1915, the figures were :—Hyde Park Corner, 35,342 ; Piccadilly Circus, 32,911 ; Trafalgar Square, 34,561 ; Marble Arch, 25,794 ; Albert Gate, 19,384 ; Oxford Circus, 21,303 ; Piccadilly (St. James's Street), 21,717 ; Oxford Street (Tottenham Court Road), 21,700 ; High Holborn (Southampton Row), 21,472 ; the Elephant, 18,856 ; Whitechapel, 17,775 ; Vauxhall Cross, 16,537 ; Blackfriars Bridge, 16,581 ; Gray's Inn Road (Theobald's Road), 17,419 ; Kensington High Street, 11,758 ; Old Street, 14,181 ; London Bridge (south side), 17,961 ; Aldgate, 13,106.

At such a point as Hyde Park Corner traffic blocks were very small. There was an even flow of traffic. Piccadilly Circus was a congested point where absolute blocks took place. One of the greatest causes of blocks was the speed at which the traffic was moving. If there was a preponderance of heavy traffic the block took longer to clear, but where light vehicles formed the preponderating portion of traffic, the block was rapidly cleared. Still another cause of congestion was the large amount of standing traffic. A frontager had the right to stand a vehicle outside his premises as long as he liked for the purpose of loading or unloading. Then people shopping by car could have their cars standing until they returned. The police had only very limited powers to regulate the flow of traffic. The problem was rendered difficult by the different speeds of different kinds of vehicles. The law provided that the drivers of slow-moving vehicles should keep to the side of the road to enable faster-moving traffic to pass. This, however, was a regulation which was more honoured in the breach than in the observance. It would not be practicable, except on short stretches, to have different routes for fast-moving and slow-moving traffic.

In regard to the recent increase of vehicular traffic, he considered that was due to business waking up after the war. There was a large amount of work to be brought up to date, and motor cars that had been laid up were brought out and put to the fullest use. At the same time congestion was much worse in the days of the horse omnibus than it was now.

NO REMEDY.

He had no suggestion to put before the Committee for relieving the present conditions. With the streets as they were at present it was almost impossible to avoid congestion. In regard to the number of people killed and injured in the streets, it had been decreasing for about three years. In 1912 there were 538 people killed ; in 1913, the number was 608 ; in 1914, 639 ; in 1915, 851 ; in 1916, 853 ; in 1917, 675 ; and in 1918, 610 ; so that during the last three years, and certainly within the last two years, there had been quite an appreciable drop. The figures for this year were still descending. The same applied in regard to the number of accidents, the figures concerning which were :—1914, 25,470 ; 1915, 25,867 ; 1916, 22,091 ; 1917, 18,172 ; 1918, 15,091.

With respect to forming queues for omnibuses, that had been tried, but it was a very difficult matter, and would require an enormous number of police. The witness also gave evidence with respect to motor cab traffic, and mentioned that he thought the formation of a Traffic Board for London would be desirable.

BOARD OF TRADE VIEWS.

Sir W. F. Marwood, permanent secretary to the Board of Trade, who was next called, explained the powers of the Board in relation to railways and tramways. Speaking of the Metropolitan District Railway, he said that the company were running 40 trains an hour, and he did not think it was possible to go beyond that. The position with regard to rolling stock was poor, as new stock had not been provided during the war, and very little repairing was done. Some of the stock now in use ought to be in the repair shop. He thought the Board ought to have the power to order the reopening of stations which had been closed during the war. In regard to having an overruling unifying authority for the whole of the traffic of London, he did not think the Board of Trade would be hostile to such a proposal. It might be to the good. The passenger traffic of London had outgrown the facilities in an extraordinary way, and if it was to be a permanent feature it would have to be met somehow. He did not know whether it would be permanent ; he could not find a reason for it. He did not agree that circular traffic routes were better than dead ends, and said that the Central London Railway moved more traffic than the Inner Circle. With regard to overcrowding, the Board of Trade had no power to deal with it. As to a proposal that the 50 per cent. increase in railway fares should be removed, he said that there would be, first, such an increase in travelling that it would be impossible to deal with it, and, secondly, there would be a loss of revenue. He admitted that people who had to travel to earn their daily bread had a strong case for removal of the increase, but it was difficult to start making exceptions. The return which had recently been completed showed

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that between 1916, before the 50 per cent. was imposed, and 1918 the railway companies had increased their receipts by £15,000,000.

EXTRA PASSENGERS.

Mr. F. L. D. Elliott, Assistant Commissioner of Metropolitan Police, giving evidence at the next sitting of the Committee on June 12, said that he was in favour of setting up a central traffic authority. He detailed the regulations under which, since the scarcity of vehicles arose, extra passengers were allowed to stand inside tramcars and omnibuses. Regarding accidents to pedestrians, it was not congestion of traffic alone that caused them, but congestion which was unregulated. The Commissioner had directed that traffic censuses should be taken every year about the month of July. Having discussed omnibus stopping places and queues, the witness recommended the provision of refuges as a preventer of accidents. There was a case where in one mile from the Marble Arch, along Edgware Road, there were no fewer than 17 deaths in one year. That sort of thing had been entirely stopped by the erection of refuges. The police had no power to compel the erection of refuges; they could only recommend the local authorities to provide them. He thought it would be an advantage if there were an authority with power to regulate omnibus routes. Whether that authority should be the Commissioner of Police or a Traffic Board was a matter of opinion. Successive Commissioners had expressed the opinion that they would not like to have that power. The chief reason for their opinion was that there would be such a lot of wire-pulling to get omnibuses off particular routes. The Commissioner had to live on friendly terms with the public generally, and he did not desire to be saddled with the odium of deciding a thing like that. In regard to instruction of the police in traffic regulation, the Commissioner considered that police officers should be armed with more definite instructions. The Commissioner had set up a committee to go into the question which included three members of the public nominated by the Royal Automobile Club. One of these was a coroner, one was a distinguished general who was a great traffic expert, and the third was an ex-superintendent of the police, who was now employed by the Royal Automobile Club. The Commissioner hoped that the Committee would be able to draft something extremely useful for instructing the police on traffic points.

In regard to trailer tramway cars, as a police officer he considered that they contained elements of danger, but as a citizen he saw great advantages in carrying as many people as possible with one motor tramcar. A trailer system applied to omnibuses would require a great deal of consideration, but it was certainly worth considering.

THE TRAFFIC BOARD PROPOSAL.

Sir Lynden Macassey, who was secretary to the Royal Commission on London Traffic, 1903-6, said that there was no subject which had engaged the attention of so many Royal Commissions, Departmental Committees, and other bodies, and on which so many specific recommendations had been made and so few carried out. The Commission of which he was secretary found that the streets in London had not been constructed on the basis of any definite plan. The same defect existed in railways and tramways. That was the cause of the whole of the present trouble. The Royal Commission were of opinion that the problem of London traffic should be dealt with as one indivisible whole, and that it could only be so dealt with by one authority with sufficient powers. The Commission urged that street improvements, new streets, and street widening should first be taken up which would assist tramway development; secondly, that street improvements should be taken up which would relieve congestion at specific points; and, thirdly, that steps should be taken for dealing with obstructions to the formation of proper streets. Very few of the recommendations with regard to streets had been carried out; on the whole, practically nothing had been done. Recommendations which had not been given effect to in London had been given effect to in New York, Paris, Boston, and Berlin. He thought the present difficulties could be solved by further means of locomotion and by the immediate formation of a Traffic Board. So far as the future was concerned, he was satisfied that the difficulties could never be solved till there was one comprehensive authority with traffic powers right through the whole of Greater London. With regard to the present the question seemed to him very largely one of providing new rolling stock on the existing routes. It was also a question of co-ordination. On the question of uniformity of fares, he thought the modern view was to recognise that as there were street conveyances like tramways and omnibuses, and either elevated railways or underground railways, endeavours should be made to secure that each of these catered for a particular class of traffic, and that the best way of arranging that was by regulating fares. He would suggest that without delay an Act of Parliament should be passed for setting up a Traffic Board with complete powers. Such a Board, he believed, could effect a considerable improvement immediately in the traffic conditions of London. He should have thought it would be possible to route traffic so as to avoid unnecessary congestion in particular thoroughfares. If new tubes were to be constructed he believed financial assistance must be afforded. There must be some basis of partnership between the local authorities and the companies. Any Traffic Board to be effective must have a "good punch." Persuasion and suggestion would not go far enough. The veto of the local authorities should be eradicated.

THE COUNTY COUNCIL TRAMWAYS.

Mr. G. H. Hume, a member of London County Council, who was chairman of the Highways Committee of that body for five years ended March last, said that in the last financial year the number of miles run on the Council's tramways was 48,052,801, a decrease of 11,000,000 car-miles compared with 1913-14, while the number of passengers was 636,157,361, an increase of 114,000,000. When war conditions came on the undertaking lost *personnel*, and the cost of material and fuel went up. The places of highly qualified men were taken by less qualified persons, who were confronted with the difficulty of collecting fares in packed cars. One of the chief needs was to simplify the system. It was owing to that consideration, and having to make both sides of the account balance and prevent the undertaking going on the rates, that they had to put up fares and reduce some of the facilities which had previously been given. The view of the Finance Committee was that the Highways Committee did not make drastic enough proposals as regarded the increase of fares. Hitherto they had been able to make both ends meet because of the extraordinary increase in the number of passengers carried. Concessions to the employees had cost about one-third of a million pounds in the wages bill—£1,000 a day extra. The cost per car-mile had more than doubled since 1913-14. It was then 6½d. This year it was estimated at 15·94d. The highest surplus on working they ever had was nearly 4d. per car-mile. The restoration of the old fares must depend on the financial position of the undertaking. They must keep it off the rates. In reply to the suggestion that at the present rate of contributions to the sinking fund the debt would be wiped off in a short period, the witness said that if that took place it would give a tremendous boon to the travelling public, as the fares could then be greatly reduced.

VETO AND COMPETITION.

In regard to the power of veto of the Metropolitan Borough Councils against new tramways, he said that in the course of 18 years the Council had only obtained powers for the construction of 51 miles out of 186 miles of tramway applied for. He thought the time had come when the abolition of the veto must be considered.

Mr. Hume, continuing his evidence at the next sitting of the Committee on June 17, said that there was a very wasteful competition between tramcars and omnibuses running on the same routes. It was for that reason that two and a half years ago the County Council entered into negotiations with the General Omnibus Company. Nothing practical resulted. It was necessary that there should be some authority to deal with competitive routes. The general feeling in the Council was that a body interested in a section of the transport facilities should not have that power. But there should be a body with powers to deal with the organisation of the traffic services of the whole of the London area. Referring to the Council's tramway schemes which had been vetoed by the Borough Councils, he said that if all the tramways applied for had been constructed the story in London would have been completely different. As to the shortage of cars, that was entirely due to war conditions. The Council had a sufficient number of cars if they were in a position to put them in running order. Parts had worn out, and during the war they had been unable to get renewals. Questioned as to the kind of central authority which should be set up, he said it should be some sort of municipal authority. The idea that there was any working connection between the Council and the underground railway and omnibus combine was absolutely wrong.

TRAFFIC AND FINANCE.

Mr. J. Calvert Spensley, assistant valuer to London County Council, said that the number of journeys per head of the population on the local railways, tramways, and omnibuses in the metropolitan district in the year 1913 was 267. In 1918 the number was 346. During the same period there was an increase in the number of passengers on the railways of 236,000,000, or 54 per cent., excluding passenger traffic on the trunk lines. Within the greater metropolitan area the railways might have carried altogether 950,000,000 passengers. In 1911 the tramways carried 992,000,000 passengers; in 1914-15, 846,000,000. The general reduction in the hours of work was likely to aggravate congestion in the future by concentrating the traffic into a shorter time.

Sir H. Haward, controller to the London County Council, said that the net debt was £8,363,000. During the five years of the war the reduction of debt had amounted altogether to about £2,200,000. There were commitments based on pre-war prices amounting to about one million. These related to the purchase of the London United Tramways undertaking in the county of London. He was doubtful whether a profit would be made on that commitment; certain reconstruction had to be carried out. If the powers for the construction of additional tramways and for an auxiliary omnibus service were granted the capital commitments would be increased by about £800,000. During the five years before the war the tramways showed a surplus of £355,000, and during the war a deficiency of £365,000.

Continuing his evidence on June 18, Sir H. Haward said that the estimated passenger and traffic receipts for the current year ending March 31, 1920, were £4,569,271, and the expenditure was £3,677,031,

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leaving a balance to meet debt charges of £892,240. The debt charges amounted to £679,673, leaving a surplus for the renewals fund of £212,567. Against that they should have to expend a sum of £371,480 on renewals this year, in order to overtake arrears of work that ought to have been carried out during the war. If they reckoned that expenditure against revenue, there was a deficiency of £158,913. In order to have carried out the policy approved in 1912 in regard to the renewals fund, they would have had to increase the fares. There was, however, a great reluctance on the part of the Council to do that. Personally he would have been very glad to have increased the fares so that the policy of setting aside to renewals fund two-thirds of a penny per car-mile might have been carried out, but the Council would not agree to that.

The witness produced a diagram of growth of expenditure which he said showed that the salaries, wages, and allowances for the current year amounted to more than the total revenue of the whole undertaking in the year before the war. In 1917-18 there was a deficit on the estimate, and that led to the first increase in fares. In July, 1918, a substituted estimate of revenue came before the Council of £3,256,000. That had turned out to be £3,466,000, or £210,000 better than the estimate. This was entirely accounted for by the fact that over 40,000,000 more passengers were carried in 1918 than in the previous year. In 1911-12 the average fare per passenger was 1·04d., and 516,000,000 passengers produced a revenue sufficient to provide £180,000 for renewals. Last year 120,000,000 more passengers were carried at an average fare of 1·21d., and yet the surplus available to meet the debt charges and provide for renewals was very small. The 120,000,000 extra passengers, at an average fare of 1·01d., gave an extra revenue of £505,000. The reduction of car mileage run resulted in a reduction in working expenses of about £200,000. Notwithstanding the fact that the revenue had increased from £1,585,000 to £2,811,000, or by £1,226,000, they had to provide somehow or other for a sum of £721,000. The increased fare of 1918-19 over 1913-14 was 0·3d. If the increased fare were worked out they arrived at £695,000. That showed clearly how it was that they had to increase fares in order to balance the accounts.

He did not see any prospect of the fares being reduced, and he hoped there would be no further rise. A great deal depended on the question of competition. He attributed something of the present financial condition to competition by omnibuses. In regard to the future, expenditure had to be faced for the re-laying of long lengths of tracks. That work would last for a period of years.

The term of borrowing powers was 60 years for the land on which stations were built and 25 years for the system other than land and buildings. The reason for the shorter period in the latter case was that they had had to deal with things which were in the nature of diminishing assets. The value of the material system as it stood to-day was greater than it was two years before the war, having regard to the changed value of money and other considerations. Against that the cost of replacement had to be borne in mind. If the redemption were spread over a longer period, some relief could be got in the matter of fares. He also agreed that it would be reasonable that the street repair work due to other than tramway traffic should be put on the rates. These changes would allow of reduction in fares, but they were very large assumptions. The increase in fares was less than the increase in working expenses. Out of £1,000,000 to be provided, the increase of fares would produce only £416,000.

GENERAL MANAGER'S EVIDENCE.

Mr. A. L. C. Fell, general manager of London County Council Tramways, stated that in 1904 the number of journeys per head of the population was 150·5, and in 1914 it was 276·5. There had, no doubt, been a considerable increase since 1914. It might safely be assumed that the number of journeys per head of the population had at least doubled during the last fifteen years, but the transit facilities had not doubled. Among the causes which had increased the volume of passenger traffic were the reduction in the hours of labour, the greater number of women employed in factories and offices, the increasing tendency to do shopping at large central emporiums, the introduction of daylight saving, the popularity of picture palaces, and difficulty in obtaining fresh houses by people who had changed their places of work. One of the handicaps of the tramway system was that it had never been designed as a comprehensive whole. There were 14 dead ends in the central portions of London. Enormous difficulty still existed in obtaining materials and putting the rolling stock and permanent way in a proper state of repair. To deal with the traffic problem the tramways needed to be linked up and extended. They were the largest passenger-carrying agency in London. Omnibus undertakings could not operate successfully in competition with tramways if they had to pay rates for the use of the roads, maintain the carriage-ways, contribute towards the cost of widening, pay interest on their debt, and repay their debt.

There were 1,452 cars in service before the war. The number actually in service now was 1,210, with 112 trailers. Other cars had had to be robbed of their parts to keep these cars on the roads. It was intended to get 1,350 cars working this summer. The remainder of the cars were waiting for materials. He saw no prospect of getting new cars in the immediate future. He thought the tramways should be allowed to run at a speed higher than the present speed, which was from six to sixteen miles, and averaged nine miles. It would be a great advantage if fresh regulations were made with regard to slow-moving vehicles. He would like to see the by-laws of Glasgow and New York adopted to guard against vehicles dashing in among passengers who were trying to get into tramcars. He did not see a prospect of much relief from congestion for a considerable time. The average fare per passenger in 1913-14 was 1·01 ; in 1918-19 it was 1·31 ; and for the week ended June 4 it was 1·49. In July it was proposed to make a concession in fares for children up to 14 years of age. A penny ticket would enable a child to travel the ordinary 2d journey, and a 2d. ticket would be available for a journey any distance by one car.

CAR REPAIRS.

Mr. Fell, continuing his evidence on June 19, said that everything possible was being done to obtain materials for repairs. The question had been taken up by the Ministry of Production, and there were now 1,210 tramway cars on the streets, that number being an increase of 40 since the representatives of the tramways met the committee of London Members of Parliament on the traffic question three or four weeks ago. They had also got more trailers. There had been delay in the supply of materials owing to congestion on the railways, but the position had greatly improved. In regard to durability of cars, they had not yet come to the end of the life of a car. They were constantly renewing parts. They had cars running now that were put on the road in 1903, and these cars were still running satisfactorily. Before the war a new car cost roughly £1,000. To-day they would not get one of the same sort for less than £3 000. With respect to the best and cheapest form of car, both with regard to trailers and coupled cars, it might be an advantage in the future to have rather smaller tractor electric cars, and either have trailers attached or coupled cars, so that frequent services could be kept up and the capacity per unit could be increased at certain rush periods. The matter was now under consideration. In reference to Board of Trade regulations, he thought the tramway department should be allowed to run more trailers and also coupled cars whenever they wanted them. As to the profit required to satisfy the financial requirements of the undertaking, he put it at about 4d. per car-mile.

The introduction of daylight saving and the reduction in the hours of labour had increased the demand for travelling facilities. If the eight-hour day scheme should lead to an increase in the number of workers desirous of travelling within the same hours, he thought that additional trailers would have to be put into service. At present, however, manufacturers in this country could not produce cars. There was no prospect of getting new cars within the next nine or twelve months.

With respect to workmen's tickets, his view was that it would be desirable to have a uniform ticket for everybody. As to linking up tramway dead ends, the Council had tried to do so, but the cost had been too great. In his opinion tramway legislation should be revised and consolidated. All transport undertakings, including omnibuses, should bear their fair share of wear and tear of the streets. Brought back to the question of fares, he said that the maximum authorised charge on the Council's tramways was 1d. per mile, and no application had been made to the Board of Trade for an increase. At present 1d. enabled a passenger on the Council's tramways to travel on an average 1½ miles.

COMPARISON WITH MANCHESTER.

Asked how the Manchester tramways were able to carry passengers at the rate of 1d. for two miles, Mr. Fell said that the Manchester system was a much better one, because it was a complete system. It was designed to cover the whole city of Manchester. It ran through the shopping areas and was properly linked up. London, on the other hand, was merely a scattered group of tramway undertakings.

Referring to the working expenses of 1913-14 as compared with the estimates of 1919-20, Mr. Fell said that in the former year the working expenses totalled £1,654,628, of which wages accounted for £1,102,220. In 1919-20 the estimated working expenses were £3,677,031, of which wages accounted for £2,421,250. The increase therefore in working expenses was £2,022,403, of which £1,255,000 represented wages. This meant that there would be during the current year an increase over the amount spent in wages in 1913-14 of 1¼ millions, or 114 per cent. This figure did not accurately represent the increased cost of labour, as the estimated car-miles to be run in 1919-20 were 53,000,000, as compared with 59,000,000 in 1913-14. If the reduction in mileage were taken into account, the increased cost in wages would be 127 per cent.

In regard to the legitimate scope of omnibus activity, he said that omnibuses should be used in pioneer work in order to find out the best routes that might be developed by tramways. He assented to the suggestion that wherever there was sufficient traffic to justify tramways, omnibuses should not be allowed to operate, except where omnibuses were run to take tramway passengers to traffic centres.

The witness was asked a number of questions as to individual fare stages and the percentage of increase, and admitted that a 1d. fare was charged for short distances. Questioned as to a strong

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feeling about the increase in children's fares, he said that the morning and afternoon journeys of the children were made at a time when the traffic was heavy. He agreed that until recently, at any rate, it had been possible to travel by car in Glasgow 1·15 miles for a halfpenny, 2·31 miles for a penny, and 4·62 miles for 2d. He quoted an opinion of the manager of the system that if it were not for the overcrowding the financial position of the department would be hopeless, and that the fares might have to be raised. He did not know whether there had actually been an increase in the fares. In regard to the length of the penny stage in London, Mr. Fell said that some were more and some less than 1·5 miles in length. He denied that it was the intention to catch people by trick sections which made them pay an extra penny for a few yards. It was the intention to do justice to the passengers.

There was no truth in the rumour that he was connected in any way with the combine. He agreed that in 1915 an attempt was made between the County Council and the General Omnibus Company to enter into an arrangement with regard to duplication of services, but it broke down. Under war conditions the Council might have been prepared to do a great deal that they would not be prepared to do now.

EVIDENCE OF THE UNDERGROUND GROUP.

On June 24 evidence was begun on behalf of the underground railway companies and the London General Omnibus Company.

Some remarkable movements in the passenger traffic of the London area were disclosed in the evidence. The witnesses were those representing the Underground Group of companies, and the voluminous statements prepared by them gave an historical, financial, and social account of the development of London traffic which is of the highest importance alike to the travelling public and to those engaged in the vast railway, tramway, and omnibus undertakings operating in and around the Metropolis.

It was shown that during the war the local railway traffic increased enormously, that the tramways also carried a much larger percentage of passengers, while the omnibuses showed a falling off of 83,000,000 in the numbers carried in 1918 as compared with 1913. This latter decrease does not, however, point to any unpopularity in the omnibuses, but is due entirely to the reduced facilities, the Government having commandeered no fewer than 1,319 omnibuses for war purposes, leaving only 1,766 to meet the growing public demand. This naturally led to congestion, and brought about an enforced transfer of passengers from omnibuses to railways and tramways, but all round the traffic increased extraordinarily, and if all forms of travel are taken into account the journeys per head of the population of Greater London are now approximately 375 per annum, or close upon the present record of Greater New York.

The total number of passengers carried locally by all classes of traffic were given as follows :—

	1913.	1918.
Electric railways	462,019,537	699,000,000
Tramways ,...	811,397,317	992,000,000
Omnibuses	733,931,201	682,000,000
Cabs (estimated)	50,000,000	—

The above table takes no account of local passengers on main line railways, estimated in 1913 at 250,000,000, or of passengers by cab.

This shows that the travelling public of London took over 2,300 million journeys in 1913, and that, allowing for the reasonable expansion of local passengers on main line railways, as well as the traffic of cabs, the total for 1918 must have reached the huge figure of 2,800 millions. These general statistics give some idea of the vast dimensions of the London traffic problem.

Turning to the statistics relating to the Underground Railway Group, Mr. F. Pick, commercial manager to the group, showed that the number of passengers carried by the underground railways and omnibuses increased from 797 millions in 1914 to 901 millions in 1918, the average receipt per passenger rose from 1·48d. to 1·83d. and the average rate of interest or dividend paid out of revenue, rose from 3·05 to 3·59 per cent. The total share and loan capital now involved in the underground group is £43,483,039. Every effort, he said, had been made to co-ordinate and consolidate the traffic facilities of Greater London. The company maintained and operated as a single fleet the omnibuses of the London General Omnibus Company, the Associated Omnibus Company, the Tramways (Metropolitan) Omnibus Company, the Gearless Omnibus Company, and the S.M.E.T.omnibuses, and the Underground Company possessed the great advantage of participating in all forms of transport—railway, tramway, and omnibus—and seeking to give to each its natural sphere and its proper traffic.

The congestion to which the growth of traffic led was entirely due, Mr. Pick declared, to the restrictions placed upon the operations of the companies during the war, in which period they gave some 16,000 men to the colours and surrendered 1,319 omnibuses and seven garages for war service. Then there were restrictions, not only on the building of omnibuses and cars for ordinary traffic, but of repairing and maintaining those left to them, owing to the factories being appropriated for war work. Under these circumstances, he contended, "the best has been done for the public with the physical capacity of our undertakings."

ELECTRIC RAILWAYS' GROWING COSTS.

Taking the different branches of the traffic, first and foremost is the work of the underground railways. The passengers carried by the four systems operated by the Company were as follows :—

	1913.	1918.
Metropolitan District ...	85,540,000	132,784,000
London Electric	90,484,878	161,490,713
City and South London ...	22,661,795	41,423,300
Central London	33,547,659	43,740,059
Total	232,234,332	379,438,072

While these figures show a large expansion in traffic, it must be remembered that there is an enormously greater expansion in the cost of working, and to this is entirely due the increase in fares. The general level of the increase in working expenses on the railways is just over 100 per cent. The largest increase—143 per cent.—is in the cost of electricity, due to the enhanced price of coal. Yet the final average increase in the rate of fare charged, allowing for all factors, may be taken at not more than 33 per cent.

"The companies," added Mr. Pick, "had always looked forward to a time when the traffic density of their routes, properly worked, would be sufficient to yield a dividend of over 4 per cent. That was the expectation—not yet realised—with which they ventured their money, and to seek to realise it in all fair ways is no extravagant demand and no blameworthy profit-taking. Now that money is costing over 5 per cent., the whole future development of London transport hinges on the degree of success which can be attained with the money already spent."

Great extensions and improvements are in contemplation, and the Underground Railway Companies are committed to an expenditure of about £3,650,000 within the next few years, largely for modernisation and completion of the existing railways as a single system.

FACTS ABOUT THE OMNIBUSES.

Some interesting facts were disclosed in dealing with the motor omnibuses. According to Mr. Pick, the serious problem before the company during the war was how to maintain themselves as effective carriers of the passenger traffic on the streets in spite of having to furnish men, vehicles, and facilities for the conduct of the war. Nevertheless, by employing every resource the company contrived to add 395 omnibuses to their working fleet. Then came petrol control, and much of the money spent in enlarging the fleet was wasted. Passengers carried by the London General Omnibus Company and allied omnibus companies during the last six years were :—

	London General Omnibus Company.	Allied Omnibus Companies.
1913	604,133,215	106,659,353
1914	581,230,228	137,493,619
1915	514,568,287	140,764,730
1916	531,656,684	147,962,763
1917	493,083,621	125,730,969
1918	521,380,247	131,182,080

The table showed that from 1913 to 1918 the omnibuses of the London General Omnibus Company experienced a loss of passengers amounting to 83 millions, or 14 per cent. In the previous period, from 1908 to 1913, which covered the development of the motor omnibus in London, there had been an increase of 394 millions of passengers, or 116 per cent. The withdrawal of omnibus facilities converted omnibus passengers into railway passengers, and so created the congestion about which complaint is made.

Dealing with the increase in the fares, Mr. Pick stated that the net earnings per passenger fell continuously from 1915 to 1918, but the increased load of passengers helped to improve the position of the company in 1914 and 1915. Since 1915, however, the expense of working a motor omnibus has risen rapidly. The general increase to date is 130 per cent., of which by far the most remarkable part is due to petrol. Petrol has increased 320 per cent. since 1913. On the top of these realised increases comes the addition occasioned by the eight-hour day, which in the case of the omnibuses will, it is estimated, raise the cost by more than 1d. per mile, and the percentage increase over 1913 to about 150 per cent.

Turning to the question of reconstruction, Mr. Pick stated that the companies' programme contemplated the entire replacement of the fleet of omnibuses by larger and improved vehicles. Already 500 of an experimental type are to be ordered, and when this contract is completed the renewal of the whole fleet of 2,742 omnibuses will be undertaken. Allowing for the scrap value of the existing fleet, this is estimated to cost approximately £2,750,000.

SOME COMPARATIVE FIGURES.

Mr. Pick said that between the years 1908 and 1913 the average receipts per passenger steadily decreased from 1·78d. to 1·47d. During the same period the companies had developed the undertakings and improved the traffic facilities of London. In 1913, when they carried 812,000,000 passengers at an average receipt per passenger of 1·47d., their total share capital was £41,232,472, and they paid a dividend of 3·18 per cent. In 1918, when they carried 901,000,000 passengers at an average receipt per passenger of 1·83d., their total share capital was £43,483,039,

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and they paid a dividend of 3·59 per cent. The sums placed to reserve were :—1913, £366,418 ; 1914, £372,584 ; 1915, £410,959 ; 1916, £463,881 ; 1917, £473,881 ; 1918, £478,881. In ratio of receipts placed to reserve, however, the percentage had fallen from 7·3 in 1913 to 6·9 in 1918. The increase in fares were entirely caused by more than corresponding increases in working expenses. The increases were justified by the results shown in the accounts of the companies. The net earnings per passenger had decreased. For example, on the London Electric Railway in 1913 the net earnings per passenger were ·91d.; in 1914, ·86d.; in 1915, ·82d.; in 1916, ·79d.; in 1917, ·82d.; and in 1918, ·77d. The ratio of expenses to receipts had increased from 47 per cent. in 1913 to 59 per cent. in 1918.

OMNIBUS RESULTS.

Turning to the omnibuses, the witness said that the net earnings per passenger had fallen continuously from 1915 to 1918. From 1913 to 1915 the company gained, owing to the congestion of traffic, but from the latter date working expenses rose rapidly, and the first advances in fares had to be made in 1917. If the fares in 1918 had been at the 1914 level, the company would not have been able to pay their charges ; they would have been about £2,000,000 short. Every effort had been made to charge reasonable fares in accordance with what the traffic would bear. Fares in the eastern districts of London were not as high as in the western districts. In the congested central districts fares averaged 1·08 miles for a penny, the object being to restrict there the number of short distance passengers so as to give better opportunities to the long distance passengers. In the outlying country districts the fares averaged 1·1 miles for a penny, as there the traffic was so light that without high fares the service could not be run. In the urban and suburban areas the average distance for a penny was 1·33 miles. On an average the increase of fares was 33 per cent. In varying the fares according to the wealth of the people in different districts, the company were not actuated by philanthropy but by commercial good sense.

Questioned as to the attitude of his companies regarding the creation of an over-riding traffic authority, the witness said that his companies had stood for a monopoly position in traffic, and they recognised that if there was a monopoly of facilities there must be some guarantee to the public that the monopoly was used rightly. In these circumstances they had no objection to the setting up of some central authority. It would be necessary for such an authority to have power to fix and control fares. In reference to the eight hours day for employees, that would cost £600,000 a year for the omnibus services alone. In regard to numbers of vehicles, there was at the outbreak of war a fleet of 3,071 licensed omnibuses working in the London area. The total number, including 14 withdrawn for overhaul, was 3,085. The War Office took 1,319, leaving 1,766. Seven garages were also taken. Two had been returned, and they were expecting that the Hounslow garage would be returned that day. The Catford garage was urgently needed—but there seemed no prospect of getting it for some time, as it was filled with machinery belonging to the Canadian Forestry Corps. During the war, by availing themselves of every possible resource, the company added to the working fleet 395 omnibuses. At the time of the armistice there were 2,101 effective working omnibuses. The number of new omnibuses licensed up to June 18 was 222. The number of temporary vehicles added to the streets up to June 18 was 94 lorries and 29 khaki omnibuses.

NEW TYPE OF OMNIBUS.

With reference to the new type of omnibus which the company proposed to adopt, the witness said that as soon as the police approved it the company would proceed to construct 500 omnibuses to be put on the streets, and those ought to be ready by the end of October. The floor of the new omnibus was lower than the present type, so that it would be more convenient for passengers entering and alighting. There would be seating accommodation for 46 passengers, compared with the present omnibus accommodation for 34. Twenty-two passengers would be carried inside and 24 outside. The weight of the new omnibus was 3 tons 10 cwt. when empty, so that it was no heavier than the existing omnibus. The length would be slightly greater, and the platform would be 3 ft. 10 in. instead of 3 ft., so that passengers could get off and on simultaneously.

NEW UNDERGROUND RAILWAY WORKS.

With respect to the underground railways, the companies were contemplating new works in connection with the City and South London Railway. They intended to increase the size of the existing tunnels so as to take rolling stock of modern type and construction similar to that in use on the London Electric Railway, and thus increase the traffic capacity of the railway. Powers were also being sought to construct subways and escalators at Clapham Common and Stockwell. They had a Bill before Parliament to authorise the necessary capital for this scheme, which was estimated to cost £1,800,000. It was also proposed to link up the City and South London Railway with the Hampstead Tube by means of an extension from Euston to Camden Town. This would provide the northern suburbs with a service to the City as well as to the West End. Perhaps the most urgent extension was one which was proposed to be made from the Hampstead Tube to Hendon and Edgware. It was important from the housing point of view. The company had already got the powers, and they proposed to proceed with the work as soon as possible. The extension would be a surface railway with cuttings in places. Plans of the proposed new rolling stock showed that while on the motor cars of the present stock there was one double and two single doors, on the new stock there would be three double and two single doors. On the trailer cars, instead of one double and two single doors, there would be three double doors, and on the control trailer cars, instead of one double and two single doors, there would be three double and two single doors. The present stock carried 120 third-class and 24 first-class passengers on three cars, and on the new stock 100 third-class and 32 first-class passengers could be carried.

MISCELLANEOUS POINTS.

Answering a variety of questions, Mr. Pick said he did not agree that there was wasteful competition in the streets. When omnibuses were put on in the morning rush hours they were not taken off during the day, because it would be a waste of time to go to and from the garages, and investigation had shown that the omnibuses carried an average of 21 passengers every hour of the day. Regarding the railways, as the present position of the case was wholly due to war causes, and in particular to the direct action of the Government in withdrawing traffic facilities, the companies had a moral claim not only upon the Government, but also upon the people to an ample and fair opportunity to reinstate themselves up to their pre-war level of operations without interference. If an authority were set up to control the traffic of London, it should be a branch of the Ministry of Ways and Communications. He said that the motor lorries were not very popular, and were a heavy loss to the company. They cost 1s. 5d. a mile to run, and earned about 9d. or 10d. Seven or eight were being added to the number in use every day. He thought fares had reached the maximum, petrol was going down in price, and the company had allowed for the extra cost of the eight hours day. He regarded trailers as impracticable with omnibuses. Asked as to whether the omnibuses had not an advantage over the tramcars which had to pay for maintenance of track, he said that the omnibus company paid £116,000 in petrol tax last year, and taking that as rates and taxes there was very little difference between them in the money paid.

COST OF OMNIBUSES.

Mr. Pick, continuing his evidence on June 25, said that the cost before the war of an omnibus chassis was £535, to which had to be added £15 for lighting installation, making £550. The estimated post-war cost of a chassis was £825, to which had to be added £45 for lighting, making £870. The cost of the body before the war was £132, and the estimated post-war cost was £309, so that the total cost of the pre-war omnibus was £682, compared with the estimated cost of £1,179 for the post-war omnibus. The omnibuses were constructed by the Associated Equipment Company, one of the combine's associated companies, and the increase was rather less than 100 per cent. In the case of railway rolling stock, they had to purchase from outside, and there was an increase in cost of 200 per cent. The omnibus company considered that five years was the life of an omnibus. They could be used for seven years, but it was found that after five years the cost of maintenance became so great that it was advisable to replace them by new omnibuses.

NEGOTIATIONS WITH THE LONDON COUNTY COUNCIL.

Mr. Pick next gave an account of the negotiations in 1915 and 1916 between the companies and the London County Council, at which the Local Government Board were represented. The subjects discussed included co-ordination of routes and pooling, and ultimately the negotiations broke down. Replying to other questions, he said that when the new omnibuses were running everybody would get a seat, and no standing would be allowed. In regard to 100 new carriages for the District Railway, he did not know when they would be delivered, but the Board of Trade had given assurance that the work would be expedited. The companies would be willing in the public interest to permit a public authority to investigate their accounts.

As to whether a Traffic Board or a special branch of the Ministry of Ways and Communications would be preferable to control the traffic of the metropolitan area, Mr. Pick said that the view of his companies was that a special branch of the Ministry would be the better authority. The traffic problem of London involved not only local railways, but also the main line railways. He therefore thought a special branch of the Ministry would be better than a Traffic Board, provided that there were proper safeguards, such as public inquiry and the giving of judgment in public.

As to workmen's fares, the omnibus company could not afford to grant them. An omnibus averaged 23 passengers every hour of the day, but if workmen's fares were instituted it would be necessary to carry 46 in order to have the same earnings. The omnibuses could not fall back on the rates. It was not the case that if there were no tramways the omnibus fares would be higher. The fares charged in the parts of London where there was no tramway competition were no more on the average than the tramways charged for similar distances.

THE MONOPOLY IDEA.

Mr. H. A. Vernet, deputy chairman of the companies, was then called, and said that they did not want a monopoly except in the

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areas that they served. They believed that the traffic could be worked by co-ordination better than by competition. He was not going to object to a monopoly. If they had a monopoly they could handle the traffic cheaply and well.

At the sitting of the Committee on June 26, Mr. Pick made a further statement on the subject of monopoly. What the omnibus company had in mind, he said, was a monopoly of organisation and management. It was not a monopoly of interest and ownership. If they had a monopoly of organisation and management, they were quite prepared to accept some form of control, even if, in connection with that, there should be guarantees to the public, both in regard to the services rendered and the fares charged. The time had come when there were indications that omnibus working would come under the control of some authority, and the omnibus company's view was that they should have a definite franchise. It was entirely in the interest of the public that there should be only one organisation operating in the streets of London, and that all its services should be co-ordinated.

THE UNDERGROUND COMPANIES' WAR WORK.

Mr. H. E. Blain, operating manager of the "combine," who was next called, said that last year over 1,000 million passengers were carried by the four underground companies and the London General Omnibus Company. The car mileage on the underground railways was 63,768,765, and on the omnibus routes 73,152,709. His companies were probably the first in the country to be affected by the war. They were asked what was the shortest period within which vehicles could be supplied with drivers and officers to be sent off to certain naval bases. They gave 48 hours, but, as a matter of fact, the whole of these vehicles were taken off service in the streets of London, altered in their coach factories, and despatched within 26 hours in charge of their own men and officers to Chatham, Dover, and Plymouth. On the declaration of war large numbers of their railway and omnibus men who were ex-Army and Navy men or Reservists in the ordinary way, or were motor-omnibus drivers who had enrolled in the special transport reserve, were called up, and within a day or two they had lost upwards of 3,500 men. From day to day the number of mobilised men grew, and it was only possible to keep the traffic of London going by getting telephonic information from the garages and depots about 11 p.m. each day, and then settling the services that were to be operated the following day and arranging for curtailing and amalgamating routes. In September, 1914, they had a telephonic inquiry from Mr. Winston Churchill, who was then at the Admiralty, as to whether, in fourteen hours, 75 omnibuses, equipped with volunteer drivers and kits, maintenance gang, and stores, could be supplied to provide the entire transport for the Antwerp expedition. The best omnibuses in service were selected and specially overhauled during the night, while volunteers, most of whom only finished work at midnight, were with their omnibuses on the Embankment at 8 a.m. on the following day for this purpose. In October, 1914, they had a request for 300 omnibuses and 330 drivers for the operations on the Aisne. From time to time, when additional necessities arose, special efforts were made to free additional men for service until no fewer than 3,481 engaged with the underground railways, 9,648 with the omnibuses, and 2,850 with the associated tramways and manufacturing companies—or a total of 15,979, had enlisted, the total number of omnibuses freed for war purposes being 1,319. On the railway side they had carried frequently at the times of highest public pressure large bodies of troops, and on the omnibuses had organised constantly varying schemes of national defence, under which, in the event of an invasion, practically the whole of the omnibus fleet, manned by their own men, would have acted as transport for the Home Forces. Had it not been for the undoubted patriotism of his companies, the congestion in London to-day would not have been anything approaching what it was.

Wages on the underground railways had during the war increased by £730,000, and the wages paid by the omnibus company had risen by £1,415,000. This, with an increase of £99,000, made a total increase of £2,244,000. The national negotiations for revised wages and hours would lead to further increases. There had been an increase in interest and dividends paid, and that was a case of virtue rewarded to some extent. In regard to queues, he was satisfied that a great deal could be done to relieve congestion if that system were extended.

Mr. Blain also gave details as to the omnibus company's "safety first" campaign, and said that while in 1913 there were 34 accidents per 10,000 omnibus miles, the number in 1918 had fallen to 14. In response, the chairman of the Committee complimented Mr. Blain on the work of the "Safety First" Council. The witness afterwards suggested that the maximum omnibus speed should be increased from 12 to 16 miles an hour, as that would be the equivalent of providing more omnibuses, and he referred also to additional trains to be run on the underground railways.

In regard to the lorry omnibuses, he said that on a recent wet day the receipts had been only 3½d. per mile run. They had over 100 lorry omnibuses, and were losing 30s. a day on each, or about £1,000 per week. Speaking of the obstruction caused by slow traffic on the streets, he said that no horse-drawn vehicles should be allowed in certain streets between 8 a.m. and 8 p.m.

WHITLEY COUNCIL FOR THE TRAMWAY INDUSTRY.

Election of Officers.

The first meeting of the Joint Industrial Council for the Tramway Industry, which has been in the course of formation for over a year, was held at the Ministry of Labour on September 5. The Council includes representatives of the Municipal Tramways Association, the Tramways and Light Railways Association, and of the employees' associations. The constitution provides that the Joint Committee of the Council shall consist of fourteen representatives of the municipal tramways, to be elected from members of tramway committees and (or) officers of tramway departments, eight representatives of company-owned undertakings, to be elected from directors or officers of tramway and light railway companies, and twenty-two employees' representatives. The members of the Council will retire annually, but will be eligible for re-election.

At the first meeting of the Council the following officers were appointed :—

Chairman.

Mr. W. J. Squires, chairman of the Highways Committee of the London County Council.

Vice-chairman.

Mr. Stanley Hirst, Amalgamated Association of Tramway and Vehicle Workers.

Joint Secretaries.

Employers.—Mr. J. Beckett, F.S.A.A., general secretary of the Municipal Tramways Association, Gothic House, Accrington. Mr. A. de Turckheim, secretary of the Tramways and Light Railways Association, 33, Tothill Street, Westminster, S.W.1.

Employees.—Mr. J. Cliff, Amalgamated Association of Tramway and Vehicle Workers, 5, Leaf Square, Pendleton, Manchester.

This is the forty-sixth Joint Industrial Council to be formed, and the fifth Council dealing with industries in which both municipal and company-owned undertakings are concerned.

CATCHING UP ARREARS.

With peace celebrations and holidays over we are all settling down to serious work, and to tramway managers in particular the coming winter will bring plenty to think about and to do. The neglect of maintenance in every department which was as inevitable as conscription during the war, has left a legacy of work which will take a long time to pull up and demand the spending of large sums of money. Of course a greater part of this will go on track reconstruction and repairs and renewals of rolling stock. It has been remarked with regard to the latter that in many systems nothing but the paint is holding the cars together, and, as we all know, this is wearing woefully thin!

The thing that strikes one in cars on many systems nowadays, is that in place of the orderly row of switches for controlling the car lighting, there is a motley collection of types, sometimes with broken covers and sometimes even with no covers at all. Even a little article like this has been, of course, almost impossible to obtain, and as most of such switches have come from America the import restrictions have made them doubly hard to get and managers have had to turn to all sorts of substitutes.

As we have noted in previous issues, this is one item that has already put itself right. A firm has been found with enough courage to risk what the Government policy might be with regard to imports and to put down plant to turn out these switches in large quantities. Already they are supplying a 500-volt switch at a price, it is pleasant to note, which is comparable with the American figure; and it is to be hoped that tramway managers will welcome and support this new British trade.

The firm is the Tok Manufacturing Company, Limited, Empire Works, West Ham Lane, Stratford, E.15, and we understand that even before they finished making their tools they had orders from all over the country enough to take their output for several weeks. It is not therefore to be expected that delivery will be obtainable from stock for some time to come, and those who require such switches will be well advised to order without delay.

The English-made switches have very wisely been arranged with the fixing and wiring holes in the same position as the American switches, so that it is quite an easy matter when making replacements to change over to the English type.

Effect of Strike at Liverpool.—As a result of the strike of employees of the Corporation Tramways, the receipts for the week ended August 9 fell to £6,502. The receipts for the previous week amounted to £23,798, and for the corresponding week a year ago £22,418.

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CONTRACTS AND ORDERS.

Liverpool Corporation have ordered 5,500 tons of Sandberg silicon-sorbitic steel tramway rails from Walter Scott, Limited, of Leeds.

Southend-on-Sea Corporation have placed an order for six double-deck top-covered cars and one toast-rack car, complete with electrical equipment, with the Brush Electrical Engineering Company, Limited. The amount of the contract is stated to be £17,886.

Accrington Electricity Committee have recommended the acceptance of the tender of the British Thomson-Houston Company for a turbo-generator and condensing plant at £32,386—turbine and generator at £24,000, condenser £7,800, and air filter £586.

Belfast Corporation have accepted the tender of the Brush Electrical Engineering Company for 50 car bodies and trucks. The general manager, Mr. J. S. D. Moffet, has been instructed to make further inquiries in regard to the equipment of the cars from the firms tendering.

Sandberg "In-situ" Treatment of Rails.—Messrs. Scholey and Company, of 56, Victoria Street, London, S.W.1, the licencees and contractors for this patent for increasing the durability of tramway rails *in situ*, have received an order for treatment of track from the Newcastle Corporation.

Trucks for Bombay Tramways.—The Bombay correspondent of the "Daily Telegraph," telegraphing on August 15, says that three years ago the Bombay Electric Tramways Company ordered 78 tramway car trucks in England, and only recently secured shipment of 64 of them. Meanwhile they purchased in America 50 trucks, which have been delivered. The company, who urgently need more cars to replace the wastage during the war, and to cope with traffic expansion, have now purchased 130 additional trucks in America, the order going there instead of to England, owing to a wide difference in prices.

The English Electric Company, Limited, Queen's House, Kingsway, London, W.C., have recently been awarded an extensive and important contract by the Leicester Corporation, in addition to the supply of a 5,000 KW. 3,000 revolutions per minute turbo-alternator set complete with condensing plant and circulating water-piping, etc. The contract includes rotary converters, transformers, and E.H.T. switchgear, and complete boiler-house equipment, including, in the initial stages, two marine type Babcock water-tube boilers, each to supply 50,000 lb. of steam per hour at 200 lb. pressure, superheated 250 deg. The above plant will be installed at the Aylestone Power Station of the Leicester Corporation, an old boiler-house being dismantled to accommodate the new boilers. The feature of this scheme of extensions is that the plant is so designed as to enable it to be easily transferred to the proposed super-power station when necessary.

FINANCIAL REPORTS AND MEETINGS.

OLDHAM, ASHTON AND HYDE ELECTRIC TRAMWAY, LIMITED.—An interim dividend of 5 per cent. per annum on the ordinary shares has been announced.

PARA ELECTRIC RAILWAYS AND LIGHTING COMPANY.—A dividend has been declared for the half-year at 6 per cent. per annum (3s. per share) on the ordinary shares.

WALTER SCOTT, LIMITED.—For the year ended June 30 last the profits, after providing for estimated liability for excess profits duty, amounted to £119,466; £16,889 was brought forward, making a total of £136,355. A dividend of 3¾ per cent. on the ordinary shares, making 12½ per cent. for the year, has been paid.

TREASURY RESTRICTIONS WITHDRAWN.—On August 19 the Treasury announced the removal of restrictions imposed during the war on the export of capital. Remittances can now be made abroad for the purchase of any form of property, and securities held abroad can now be sold at the Stock Exchange, provided they have not been in enemy ownership since the outbreak of war.

WEST HAM CORPORATION TRAMWAYS.—In the year ended March 31 last the expenditure, including war allowances of £15,433, was £199,576, an increase of £30,750. The income, after deducting sums due to other authorities for through running, was £287,487, an increase of £48,636. There is a gross profit of £22,469. If war allowances were excluded, the gross profit would have been £37,911. After repayment of mortgage loans, contribution to sinking fund and interest, there is a deficit of £7,703.

ABERDEEN SUBURBAN TRAMWAYS COMPANY.—The report for half-year ended July 31 last states that profit amounts to £2,908, which, with amount brought forward, makes £5,393. Owing to improved returns from invested capital and otherwise, directors are in a position to recommend an increase in dividend. They propose to add £1,200 to renewal and depreciation account, which will then stand at £20,300, pay a dividend at the rate of 7 per cent. for past year, and carry forward £1,907.

SUNDERLAND CORPORATION TRAMWAYS.—The annual report for the year ended March 31, 1919, shows that the total revenue was £119,691, and working expenses amounted to £67,321. After deducting interest on capital, sinking fund, income-tax, and other charges, the sum of £9,865 was placed to reserve and renewals fund, and £5,000 was paid to the borough fund. The passengers carried numbered 26,251,700. The total working expenses per car-mile were 12·2d., and the traffic revenue per car-mile 21·4d. Power consumption averaged 1·39 units per car-mile.

DUNDEE CITY TRAMWAYS.—The estimates of income and expenditure for the twelve months ending May next include a heavy increase in working expenses. The total working expenses for last year were £76,225, and the estimated total for expenditure next year is £100,338, an increase of £24,113. The estimated income for the current year is £130,820. Last year the income was £105,953. At a Town Council meeting the convener of the Tramways Committee, Mr. G. A. Johnston, said they proposed to spend £10,000 on the permanent way, which had been much neglected during the war. The Town Clerk reported that he was getting particulars from various Corporations where they had power to devote the profits from the tramways to the assistance of the rates. In Dundee at present they had no power of this kind.

GLASGOW CORPORATION TRAMWAYS.—The annual report of the Glasgow Corporation Tramways for the year ended May 31, 1919, has recently been issued (56 pages, 13 in. by 8 in.). A summary of the results was published in our issue of July 17. As there stated, the total revenue amounted to £1,531,319, and the total expenditure to £1,249,988. After allowing for rent of Paisley lines, income-tax, renewals and depreciation, there was a balance of £14,773, which was paid over to the common good. The total amount of expenditure on capital account at May 31, 1919, was £3,880,299. The balance standing at the credit of the depreciation and permanent way renewal fund was £449,005. The rates of depreciation and permanent way renewal are now as follows:—Permanent way, £700 per mile of single track; power station and sub-stations plant, 3 per cent.; cars, 5 per cent.; electric equipment of cars, 5 per cent.; other rolling stock, 15 per cent.; and Clydebank bridges, 5 per cent.

ABERDEEN CORPORATION TRAMWAYS.—The results for the year ended May 31 last constituted a record, said Dean of Guild Meff, convener of the tramways committee, in presenting the report to the Town Council. The total receipts amounted to £140,901, showing an increase of over 20 per cent. compared with the previous year. The working expenses were £108,457, or an increase of 40 per cent., due mainly to the increase in wages. The net surplus was £6,836, a decrease of 44 per cent. compared with the previous year. Aberdeen is one of the few tramways still operating with the pre-war scale of fares, but the results of the past year show that it will no longer be possible to carry on the undertaking on sound business lines unless alterations in the fares are made. This matter is being considered at the present time by a sub-committee. The total wages paid in 1914 were £22,611; last year wages had increased to £56,308, and this year the Corporation is faced with a further addition of about £18,000, even if no further increases are granted.

OLDHAM CORPORATION TRAMWAYS.—In his annual report for the year ended March 25, 1919, Mr. William Chamberlain, general manager and engineer, states that the financial results for the year constitute a record. The total receipts amounted to £184,029, an increase of £32,618 as compared with the previous year, and the working expenses to £124,336, an increase of £17,399. The profit on working was £59,693, or £15,219 more than in the previous year. Including interest received (£6,507), there is a balance of £66,200, which is allocated as follows:—Interest on loans, £12,128; contributions to sinking funds, £12,538; interest to sinking funds, £7,485; rent of leased lines, £5,348; income tax deductions, £8,557; renewals reserve fund, £19,230; balance (deficiency) on motor omnibuses, £914. Passengers numbered 31,229,035, and car miles 2,093,946. The average revenue per car-mile was 21·093d. (compared with 17·132d. a year ago), and the working expenses 14·215d. (compared with 12·099d.). The percentage of working expenses to receipts was 67·56. Energy consumption averaged 1·759 units.

BRIGHTON CORPORATION TRAMWAYS.—In his report for the year ended March 31, 1919, the engineer and general manager (Mr. William Marsh) states that all previous records were again beaten in the revenue and number of passengers carried. The growth of the undertaking in recent years is shown in the comparative statement of results given in the table below. Although the revenue increased by 7·78 per cent., the working expenses increased in a far greater proportion, the addition being as much as 26·25 per cent. The net balance (£5,092) was consequently much smaller than in the preceding year. The increase in working expenses is, of course, due to the cost of labour, materials, and electricity. Not only has the total amount of the weekly wages sheet been more than doubled during the last three or four years, but the average rate per hour has more than doubled. In 1914 the weekly wages were £414, the average earnings per employee 27s. 5d., and the average wage per hour 6·53d. In 1919 the weekly wages were £829, the average earnings per employee £2 16s. 9d., and the average earnings per

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hour 13·19d. In the current year Mr. Marsh says there is every probability that wages alone will amount to £50,000, or more than the entire revenue of the undertaking a few years ago. Owing to the coal shortage the mileage was cut down by nearly 20 per cent., but there was an increase in passengers of nearly a million and a half. For a period of practically eleven and a half years there has been scarcely any change in fares, but in consequence of the increased working expenses a revised scale was adopted on March 31, 1918. The average fare received has been 1·1d. per passenger, but this figure has been increased to 1·3d.

Year ended March 31.	1919.	1918.	1917.	1916.
	£	£	£	£
Traffic revenue	84,414	77,916	62,527	55,871
Miscellaneous revenue	2,574	2,306	2,292	2,065
Toral revenue	86,988	80,222	64,819	57,936
Working expenses	65,646	48,398	41,498	41,001
Surplus on working	21,342	31,824	23,321	16,935
Bank interest	570	391	134	38
Total gross profit	21,912	32,215	23,455	16,973
Interest on capital	7,232	7,301	7,345	7,348
Sinking fund	5,790	6,195	6,432	6,429
Income tax	3,798	2,041	1,644	965
Revenue contribution to capital outlay	—	1,250	513	—
Net balance	5,092	15,428	7,521	2,231
	21,912	32,215	23,455	16,973
Car-miles run	951,072	1,152,006	1,131,201	1,053,285
Passengers carried	18,498,267	16,942,512	13,678,251	12,295,198
Number of units used	1,670,949	1,907,537	1,837,629	1,678,627
Units per car-mile	1·76	1·65	1·62	1·59
Average traffic revenue per car-mile	21·302d.	16·23d.	13·26d.	12·73d.
Average traffic revenue per mile of single track	£4,910	£4,532	£3,637	£3,191
Average total revenue per car-mile	21·95d.	16·71d.	13·75d.	13·202d.
Percentage of working expenses to receipts	72·89	57·25	58·56	64·14
Average working expenses per car-mile (excluding power) ...	13·01d.	7·17d.	5·78d.	63·5d.
Average working expenses per car-mile (including power) ...	16·00d.	9·56d.	8·05d.	8·47d.
Average car-miles per day per car	79·25	83·92	88·56	77·76
Average journeys per head of population per annum ...	138·11	126·5	102·13	91·8

PERSONAL.

Mr. William Chamberlain, tramways manager of Oldham Corporation, has been granted an increase in salary from £450 to £700.

Mr. Lachlan Mackinnon, traffic superintendent of Glasgow Corporation Tramways, has been appointed deputy tramway manager at a salary of £1,000 a year.

Mr. H. F. G. Woods has been appointed borough electrical engineer at Torquay, at a salary of £500 per annum. There were over one hundred applicants for the position.

Mr. C. H. Merz is visiting Cape Town to investigate the proposed electrification of certain sections of the South African Railways, and to advise the Union Government regarding the production of electric power.

Doncaster Tramways Committee have accepted with regret the resignation of **Mr. E. S. Rayner,** borough electrical engineer and tramways manager, who has recently been appointed manager and engineer of the Hull Corporation Tramways.

Mr. H. S. Ellis, on his departure to take up the position of borough electrical engineer at Southampton, was presented by the South Shields electricity staff and employees with a travelling case and slide rule, and Mrs. Ellis was presented with an oxidised silver table lamp.

Salary Increases at Sheffield.—Sheffield City Council has granted increases in salaries to a number of officials of various departments, including **Mr. A. R. Fearnley,** general manager of the Corporation Tramways and motor department, from £1,200 to £1,500 a year by annual increases of £100.

Mr. H. G. Burgess has been appointed the chief representative of the Ministry of Transport in Ireland. He has been in the service of the London and North Western Railway Company for forty years, and has been the company's general manager in Ireland, responsible for all its shipping and railways, for the past twenty years. During the war he was Director of Irish Transportation and the Coal Controller's representative in Ireland.

Mr. H. P. Stokes has been appointed general manager of Plymouth Corporation Tramways, and will succeed Mr. C. R. Everson, who is retiring. The salary of the new general manager will be £700, rising by £50 per annum to £800. Mr. Stokes had just received a similar appointment at Doncaster, but he has decided to accept the Plymouth appointment. For the past six years he has been electrical engineer and manager of Bexley Council Tramways, during which the undertaking has been extended and traffic has much increased. For six years previously, Mr. Stokes was assistant engineer and manager of Burton Corporation Tramways and electricity undertaking, and before that he was electrical engineer and tramways manager of Ilkeston Corporation for over eight years.

Mr. James Dobson, who has recently been appointed general manager of Southampton Corporation Tramways, has had much experience of tramway work abroad. He spent two years in the construction and equipment of Johannesburg municipal tramways as assistant in the manager's office on the engineering staff. From 1906 to 1908 he was in charge of the electrification of the Kimberley-Victorian tramways, and was responsible for the maintenance of the system and control of the traffic. From 1908 to 1912 he was superintendent of construction and equipment of the rolling stock of the Rio de Janeiro Tramways, Light and Power Company, which then had 300 cars and 180 trailer cars. The following year he became superintendent of rolling stock and traffic manager of the Rio de Grande Tramways, Light and Power Company, Pelotas, Brazil. On returning to England he was appointed engineer and manager of the Barrow-in-Furness Tramway Company, subsequently becoming manager of the Gravesend and Northfleet tramways.

TRAMWAY AND LIGHT RAILWAY NOTES.

ABERDEEN.

HALFPENNY FARES—SERVICE MEN RETURNING.

The Tramways Committee are discussing the abolition of halfpenny fares. The estimates for the current year indicate a deficit of £5,000, and it is clear that some change must be made. The abolition of the halfpenny fare is, however, strongly opposed by some members of the committee. Of 171 original employees of Aberdeen Corporation Tramways who enlisted with the colours, 18 were killed, 124 have been demobilised and reinstated, and 29 are still on service. Temporary employees, including women, are being dispensed with as the soldiers return. During the present year the number of women employed has decreased by 63. On June 1 the staff comprised 425, and at present there are over 450 employees.

BARROW-IN-FURNESS.

PROPOSED PURCHASE BY THE CORPORATION.

A special meeting of Barrow Town Council will be held on September 23 to decide whether the Corporation shall exercise their powers under Section 43 of the Tramways Act of 1870, the Barrow-in-Furness Tramways Order, 1903, and under an agreement with the British Electric Traction Company, to require the sale to them of the tramway undertaking. A resolution will be submitted in favour of the purchase, and authorising a sub-committee to take the necessary steps to carry the proposal into effect.

BLACKPOOL.

FINE FOR DANGEROUS DRIVING.

At Blackpool, on August 25, a driver pleaded not guilty to a charge of dangerously driving a car of the Blackpool, St. Anne's and Lytham Tramways Company along Central Drive. It was stated that on June 24 he drove a car from the direction of the Central Station at a high speed. On the roadway opposite a shop was a lorry which the car could not pass, and on which was a man who waved for the driver to stop. The latter took no notice, however, and the car struck the lorry. The man was thrown upon his side, and was severely hurt. The defendant was fined 20s.

BURNLEY.

PROPOSALS FOR EXTENSIONS DEFERRED—EMPLOYMENT OF DISABLED SOLDIERS.

Burnley Tramways Committee have unanimously agreed not to proceed with the proposals for tramway extensions. The total length of the new line suggested was about six miles, and the cost of construction was estimated at £140,000, or, including new cars, £250,000. The Tramways Committee have asked the Town Council to allow them to employ disabled sailors and soldiers to the extent of 5 per cent. of the adult male staff.

BURY.

EMPLOYEES' HOLIDAY.

The Town Council has granted six days' holiday yearly, including Christmas Day, New Year's Day, and Good Friday, with pay, to the skilled men employed in the tramway depot.

DARLINGTON.

PROPOSED EXTENSIONS.

At a recent meeting Darlington Council decided to obtain Parliamentary powers to extend the Corporation Tramways system into the Hopetown district.

DONCASTER.

RESUMPTION OF SERVICE AFTER THREE WEEKS' STOPPAGE.

After a suspension of three weeks, owing to the Yorkshire coal strike, service on the Doncaster Corporation Tramways was resumed on August 15.

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DUBLIN.

FORTY EIGHT HOURS' WEEK.

The Dublin United Tramways Company has arranged for a forty-eight hour week for the employees, entailing a reduction of twelve working hours in the week. Sunday work will be paid for at overtime rates, and there will be one free day in seven.

DUNDEE.

PURCHASE OF ADDITIONAL CARS—INCREASED COST OF ELECTRICAL ENERGY.

At a meeting of Dundee Tramways Committee, Mr. Peter Fisher, general manager of the tramways department, reported on the negotiations for the purchase of six additional cars. Mr. Fisher said that the cost of materials had greatly increased. Knowing however, that Dundee Corporation were old customers, the contractors had agreed to supply four cars in addition to the ten previously ordered at the same price. For two other cars the price was so much above anything expected that no order had been placed. It was agreed that a sub-committee should consider the matter and report. The electricity department had raised the price of electric supply to the Dundee, Broughty Ferry, and District Tramways Company from 1·25d. per unit to 1·75d., plus 10 per cent.

GLASGOW.

CAR BUILDING RESUMED—PASSENGER FINED FOR OBSTRUCTION—WASTE TICKETS—SILVER BADGES TO LONG SERVICE MEN.

The work of car building has been resumed at the Glasgow Corporation car shops at Coplawhill. During the war these were devoted to the production of munitions. New cars are now being turned out as rapidly as circumstances permit, as additional cars are urgently needed to cope with the increasing traffic. At Glasgow a man who was charged under a tramway by-law with having obstructed a woman conductor in the discharge of her duties by refusing to leave a car which had its full complement of passengers, was fined 31s. 6d. It was stated that the defendant was asked to leave the car, but he refused, contending that he was as much entitled to stand as were other passengers. The car was delayed about eight minutes by his refusal. The Glasgow tramways department, in the interests of economy and street tidiness, have drawn the attention of passengers leaving the cars to the boxes provided for used tickets. Only a portion of the passengers make use of the receptacles, and at busy stopping places the roadways are littered with tickets; but over two tons of used tickets are collected weekly from the receptacles and sold at a good price as waste paper. Silver badges have been presented to 99 men of the uniformed staff of the Glasgow Corporation Tramways who have completed 25 years' service.

LANARKSHIRE.

PROPOSED PURCHASE BY LOCAL AUTHORITIES.

At a recent joint meeting of representatives of the Lanarkshire county and burgh authorities, Sir Thomas Munro, county clerk, stated that the option of purchase conferred upon the County Council by an agreement annexed to the Lanarkshire County Tramways Act, 1912, would expire within the next few months. Unless within that period the local authorities by joint action agreed to acquire the whole of the tramway undertaking, the Bellshill lines, which were constructed at the cost of the County Council, and were at present worked by the Lanarkshire Tramways Company on lease, would fall to be transferred to the company. There would be no other opportunity of compulsory purchase before 1928. In 1928 the system could be acquired at fair market value, and in 1938 at scrap iron value. The authorities should therefore consider jointly whether any steps should be taken to acquire the tramways. Sir Thomas Munro has communicated with the tramway company asking them to state what price they would be prepared to accept for the undertaking.

LIVERPOOL.

FIFTY YEARS OF TRAMWAYS—LONG SERVICE CONDUCTOR.

On July 27 occurred the fiftieth anniversary of the beginning of work on the construction of the first tramway in Liverpool. This line ran from the Town Hall to the Dingle, and was open for traffic a few months later, ten cars being put in service. The fare was 3d. inside for any distance, and 2d. outside. The cars were popular from the outset. A conductor in the employ of the Liverpool Corporation Tramways has seen twenty-seven years' service. He was originally employed by the old Liverpool Tramways Company, and was transferred to the Corporation when the tramways were taken over. There are said, however, to be men whose period of service has been even longer than this.

LONDON.

DEMOBILISED MEN REPLACE WOMEN CONDUCTORS.

The policy of the London County Council is to dispense with the services of women conductors at the earliest possible moment, and to replace them by former conductors returning from service with the forces and other demobilised men. In June last 2,051 men had returned, and there were only 129 conductors remaining to be demobilised and this number has since been considerably decreased. At the time of the strike in 1913 on the London County Council Tramways a number of men were dismissed. The tramways department has now decided to reinstate the dismissed men of military age and fitness on their return from the services. The earlier policy was to allow the men on discharge to rejoin the tramways as new hands with a loss of all privileges their previous service had brought them. The men's union, however, pointed out that the fit men dismissed after the strike were without the London County Council's allowances for dependants while in the forces, while their fellow-strikers taken back because of temporary unfitness for immediate service were given these allowances when called up under the Military Service Acts.

MANCHESTER.

CONDUCTOR'S EYESIGHT—WITHDRAWAL OF WOMEN EMPLOYEES.

At an inquest held at Manchester on the body of a woman who died as a result of a fall from a tramcar, the City Coroner expressed the opinion that ex-soldiers suffering from impaired eyesight should not be employed as conductors. The woman had attempted to board the car while it was moving, and fell back on the roadway, sustaining concussion of the brain. The conductor stated that the car came to a stop at the compulsory stopping place, and seeing no one wishing to board he gave the signal to proceed. When the car had gone a few yards he saw the deceased trying to get on. A witness gave evidence that the car had begun to move before the passenger attempted to get on, and that neither the driver nor the conductor saw her. The coroner said that while no blame was attached to the conductor, he felt that, in view of the fact that he had lost an eye through service abroad, he ought to be found other work. On behalf of the Manchester Corporation Tramways Committee, counsel undertook that the coroner's observations would be conveyed to the proper quarters. From about 880 women and 250 girls employed on Manchester Corporation Tramways, the number has been reduced to about a dozen trolley girls.

ROTHESAY.

PROPOSED SUNDAY CARS.

At a meeting of Rothesay Town Council, Provost M'Millan announced that the Rothesay Tramway Company were prepared to provide the town with electric lighting along the sea-front on very advantageous terms, on condition that they were allowed to run the Ettrick Bay service of cars on Sundays.

SOUTH SHIELDS.

PROPOSED LIGHT RAILWAY.

South Shields Town Council have decided to make an application to the Light Railway Commissioners for an order for the construction of a light railway between South Shields and Cleadon. The Corporation recently purchased Cleadon Park, which is about three miles from the town, and they desire to make it more accessible as a housing scheme will be carried out there.

WALLASEY.

ISSUE OF PREPAID TICKETS.

Wallasey Tramways Committee have decided to issue prepaid tickets as from September 1. These tickets will be purchaseable in packets of thirteen 1d. tickets for a shilling, and thirteen 1½d. tickets for one shilling and sixpence.

MINISTRY OF TRANSPORT.

HEADS OF DEPARTMENTS.

The following are the heads of the various departments of the Ministry of Transport:—

Civil Engineering.—Sir Alexander Gibb, K.B.E., chairman Easton, Gibb and Son, Limited, and chief engineer of ports of construction to British armies in France and Belgium, etc.

Mechanical Engineering.—Lieutenant-Colonel L. Simpson, D.S.O., formerly traffic superintendent for the Buenos Aires and Pacific Railway, and now chief mechanical engineer in charge of railway equipment for the British armies in France.

Consulting Mechanical Engineer.—Sir John Aspinall, late general manager of Lancashire and Yorkshire Railway, and Associate Professor of Railway Engineering in Liverpool University.

Traffic Department.—Sir Philip Nash, K.C.M.G., locomotive engineer to the Great Northern Railway Company, and deputy-director-general of transportation to the British Expeditionary Force during 1916.

Finance and Statistics.—Sir George Beharrell, D.S.O., formerly assistant goods manager for the North Eastern Railway Company, and leading statistical officer in various Government war services.

Development Department.—Rear-Admiral Sir Charles Martin de Bartolome, K.C.M.G., late Third Sea-lord and controller at the Board of Admiralty.

Public Safety and Labour.—Sir William Marwood, K.C.B., served in the Post Office and Board of Trade Department, and has been employed in various transport inquiries.

Roads Department.—Brigadier-General Sir Henry Maybury, K.C.M.G., formerly County Surveyor of Kent, and now manager and secretary of the Road Board.

Secretarial and Legal.—Sir R. F. Dunnell, K.C.B., secretary and solicitor to the North-Eastern Railway Company.

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DIARY OF THE MONTH.

FRIDAY, AUGUST 1, TO SUNDAY, AUGUST 31.

FRIDAY, AUGUST 1.

Sheffield tramway workers pass a resolution in support of the police strike.—Brighton Town Council decide to issue three-day season tickets on Elmgrove route for the race days.—Brighton Tramways Committee report states that £10,000 per annum for seven years will be required to improve and maintain the tramway tracks.—Exeter Tramway Committee, in annual report to the Town Council, show a net profit on the year of £877, and total traffic receipts of £22,633, an increase of £2,000 over previous year.—Chicago tramway strike ends.—London Underground Group issue a reply to the criticisms of fare charges on Underground railways by Select Committee of Enquiry into London Traffic.

SATURDAY, AUGUST 2.

Salford Tramway Department employees pass a resolution giving notice of strike unless the women employed as cash receiving clerks are dismissed.—The Council of Yorkshire Miners' Association meet at Barnsley and resolve to consult the branches as to whether the strike should be continued or not.—Liverpool members of the Municipal Employees' Association employed on the tramways decide to strike.

SUNDAY, AUGUST 3.

Mr. Kennedy Jones, M.P., defends report of the London Transport Committee in an interview published in *The Observer*.—Result of ballot vote on employment of women clerks by Salford Corporation declared at a mass meeting of tramway employees, showing an overwhelming majority in favour of striking to enforce the demand for dismissal of the women.—Surprise strike of locomotive employees on London and South-Western Railway at Nine Elms in sympathy with the police.—A motor omnibus overturns at Epsom, with the result that one woman is killed and several other passengers injured.

MONDAY, AUGUST 4.

Bank Holiday.—No tramway service in Liverpool, owing to the majority of the drivers and conductors having refused to report for duty.—Aberdeen Town Council refuses the request of the Discharged and Demobilised Soldiers' and Sailors' Association that disabled men should be given free passes on the tramcars.—L.C.C. tramcar leaves the rails in King's Cross Road, and damages a grocer's shop.—Replying to a question in the House of Commons, Mr. Bonar Law expresses the hope that the Government will be able to take some action on the London Transport Committee's report before adjourning for the recess.

TUESDAY, AUGUST 5.

A complicated series of accidents occur in Leicester, a motor lorry colliding with a tramcar, and a cyclist knocking over Sir Jonathan North, who had come out of the tramcar to straighten out the dispute between the lorryman and the tramcar driver.—Glasgow Corporation Tramways Committee again remit to a special sub-committee the question of abolishing halfpenny fares.—By a majority vote, Glasgow Corporation Tramways Committee refuse to grant free passes on the tramcars to members of the Corporation.—Statements on the strike issued by Liverpool Corporation Tramways Committee and the officials of the tramwaymen's unions.—House of Lords resume committee on Transport Bill, a new clause providing for appeal against refusal of a licence to ply for hire with an omnibus being accepted.—City and South London tube railway service temporarily suspended, owing to a number of the employees declaring a strike in sympathy with the policemen on strike.—Salford Town Council Tramways Committee agree to discharge women clerks and employ men instead.—Chesterfield Town Council agree to the recommendation of the Electricity and Tramways Committees that the two undertakings should be under one general manager, and that applications for the post be invited.—Liverpool municipal workers endorse the action of the tramwaymen on strike.

WEDNESDAY, AUGUST 6.

Glasgow Town Council Tramways Committee agree that shelters should be provided for car passengers at Paisley Road Toll and Shawlands Cross.—Badges are presented to 99 men of the uniformed staff who have completed 25 years' service in Glasgow Corporation Tramways Department.—Stockport Town Council agree to the transfer of the site of Heaton Lane Gas Works to the Tramways Committee for use as a tramcar shed.—Railway strikers at Nine Elms and on the City and South London tube ordered to return to work by their unions.—In reply to a question in the House of Commons, Mr. Stanley Baldwin states that the grants for roads up to July 31 amount to £9,100,000.—Belfast Town Council Tramways Committee grant free passes on the cars to all the men who have lost a limb in the war.—Sir Thomas Munro, Clerk to the County Council of Lanarkshire, asks the Lanarkshire Tramways Company to state what they are prepared to accept for their undertaking.—Full tramway service at Hull restored.—The Secretary of the Municipal Employees' Association declares the strike of Liverpool tramwaymen unauthorised.

THURSDAY, AUGUST 7.

As Brighton tramway traffic receipts have increased by over £8,000 in four months, the Town Council decide that the proposals of Messrs. Tilling to run motor omnibuses on the central route for a payment of £40 per omnibus, is not acceptable.—At Lambeth County Court, £30 in name of damages for personal injuries are awarded a woman, though the conductor asserts that the chain preventing ingress to the car was fastened.—Dundee Town Council reject a proposal of the Tramways Committee for the construction of a tramway line along Clepington Road.—Treasurer Barrie, of Glasgow Corporation Finance Committee, states that the Tramways Department is faced with a large deficiency in the coming year.—Sheffield Town Council publish correspondence between Mr. A. R. Fearnley, general manager of the Corporation Tramways, and Mr. F. Thraves, secretary of the Sheffield branch of the Tramway and Vehicle Workers' Union, in which further concessions in regard to pay and hours are discussed.—Blackburn Town Council sanction acceptance of a tender from the English Electric Company, Limited, for the erection of a generating station at Whitekirk, the total cost of which is estimated at £270,000.—Mr. Bridgeman, in the House of Commons, states the coal output is being reduced by 50 per cent.—In the House of Commons, Mr. Bonar Law states that the report of the Committee on Metropolitan Transport is at present under the consideration of the departments concerned.—Darlington Town Council decide that it is advisable to extend the tramway system into Hopetown district.

FRIDAY, AUGUST 8.

Strike of Liverpool Corporation tramway workers ended by negotiation.—Hull City Council sanction increased tramway fares and adoption of the stage system.—Ballot vote taken by the employees of Sheffield Corporation Tramways Department on whether they should strike to enforce new demands.—Normal traffic conditions resumed on London and South Western Railway and City and South London Tube Railway.—Cinema films take fire on a Burnley tramcar.—Manchester Corporation Tramways Department makes final arrangements for dispensing with women's labour on the tramcars.

SATURDAY, AUGUST 9.

The hot weather having caused the rails to bulge, the London District Railway operates the traffic on a part of the Uxbridge section on a single line.—Manchester City Coroner suggests that conductors who have lost an eye in service should be given other employment.—Dalmuir and Balloch tramcar service stopped for a time owing to a breakdown in Clyde Valley Electrical Works.—Denbigh Light Railways Committee submit to the County Council schemes for new light railway lines.

SUNDAY, AUGUST 10.

Revised fares and fare stages on Coventry Corporation Tramways come into operation.—Mr. J. H. Thomas, general secretary of the National Union of Railway Workers, addressing a mass meeting at Yarmouth, urges that peace be preserved on the home front.

MONDAY, AUGUST 11.

New type of motor omnibus constructed for the London General Omnibus Company tested on the Metropolitan Police testing ground, giving good results.—London Members of Parliament meet and pass a resolution expressing regret at Government inaction on the London Traffic Report.—Strikes again break out in Cairo, and the tramways stop running.—Dundee Corporation Tramways Committee obtain supply of new cars at former contract price, for "old times" sake.—Dundee Town Council consider new demands put forward by tramway workers.—Rothesay Town Council consider the offer of the tramway company to light the sea-front on favourable terms on condition that they are permitted to run cars to Ettrick Bay on Sundays.—Dundee Corporation Electricity Department decide to raise the price of electrical power-supply to the Dundee, Broughty Ferry, and District Tramways Company.—Commissioner of London Metropolitan Police issues a memorandum on the lighting of vehicles.—Strike of tramway employees at Capetown, begun on July 19, settled.

TUESDAY, AUGUST 12.

Twenty persons injured in a collision on the Morecambe tramway at Heysham.—Tramcar runs away on Sodhouse Bank, Low Fell, Gateshead, and collides violently with a trolley.—While being towed by another tramcar along Hackney Road, a tramcar jumps the lines and crashes into a restaurant.—Lanarkshire Miners' Union decide to ask the Labour Members of Parliament to raise the question of adequate supply of workmen's cars in the House of Commons.

WEDNESDAY, AUGUST 13.

Dudley and Stourbridge Tramway Company announce that they intend raising the minimum fare from 1d. to 1½d.—The Coroner of Hobart, Tasmania, advises that tramcar conductors should be taught elocution.—Representatives of the Railwaymen's Unions and officials of the Board of Trade hold a conference at which decisions likely to be acceptable to the men are arrived at.

THURSDAY, AUGUST 14.

A contractor obtains £43 damages from Sheffield Corporation, for injuries to a steam wagon caused by the negligent driving of a tramcar.—Sheffield City Council agree to the proposals of the Corporation Tramways Committee to lay a portion of the tramway lines on a sleeper track and to purchase land adjoining a tramway junction.

FRIDAY, AUGUST 15.

Sheffield Corporation tramway employees hold mass meetings for the purpose of formulating claims for increased wages.—Doncaster Corporation Tramways resume service after being suspended for three weeks.—Birkenhead Corporation tramway employees declare for a strike by a ballot vote, but the executive of the men's union decide to withhold the strike notices in the meantime.—A tramcar trolley pole is displaced on a West Hartlepool tramcar coming in contact with a standard and breaking, and injuring a passenger.—Car construction resumed at Glasgow Corporation Coplawhill Works.—Royal assent given to the Transport Bill.—Public Works Loan Bill passes through Committee in the House of Commons without amendment, and is read a third time.—Employees of Nice and District Tramways begin a strike.

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SATURDAY, AUGUST 16.

London County Council tramcar, getting out of control, leaves the track and overturns at St. Pancras, killing two and injuring 17 passengers.—A passenger on a motor omnibus in Lewisham is seriously injured by a passing tramcar, his head coming in contact with the window of the car.—Glasgow Corporation Tramways Department call the attention of passengers to the advisability of using the receptacles provided for used tickets.

MONDAY, AUGUST 18.

Stirling and Bridge of Allan Tramway Company decide to provide motor omnibuses for supplementing and extending their services.—Burnley Corporation Tramways Committee decide to ask the Town Council to allow them to employ disabled soldiers and sailors.—Subways of New York stopped owing to a strike of employees, but settlement of the dispute by negotiation is reported.—Railway workers' union executive confer with Board of Trade officials, and agree to a basis of settlement, but ask for another conference.—Mr. Lloyd George explains the Government policy to the House of Commons in a speech lasting three hours.—Gosport Town Council decide to institute a motor omnibus service.

TUESDAY, AUGUST 19.

New York subways resume service.—South Shields Town Council resolve to make application for powers to construct a light railway to Cleadon.—Burnley Town Council, considering the report of the Tramway Committee declaring the abandonment of schemes involving a total cost of £2,000,000, order an inquiry into the finances of the town.—Belfast Town Council accept the tender of the Brush Electrical Company, Loughborough, for trucks and bodies of 50 new tramcars

WEDNESDAY, AUGUST 20.

Huddersfield County Borough Council decide to extend their tramways to Brighouse.—Doncaster Town Council appoint Mr. H. P. Stokes, of Bexley Heath, to the position of electrical engineer and general manager of the Corporation tramways.

FRIDAY, AUGUST 22.

Wallasey Tramways Committee decide to issue prepaid tramway tickets in packets of 13.—The will of William M. Murphy, late chairman of Dublin United Tramways, shows that he left £264,000.—Mr. Lloyd George publishes a summary of his long speech in the House of Commons.—Mr. James Dobson, general manager of Gravesend and Northfleet Tramways, appointed general manager of Southampton Corporation Tramways.—London County Council decide against the proposal that season tickets should be issued for the tramways.

SATURDAY, AUGUST 23.

Barrow Town Clerk issues summonses for a special meeting of the Town Council to consider purchase of Barrow Tramways, on September 23.

SUNDAY, AUGUST 24.

Burton-on-Trent tramway employees hold a mass meeting, at which it is resolved to support the demands of the Transport Workers' Federation, alleging that brewery labourers are better paid than tramway conductors.

MONDAY, AUGUST 25.

Leeds tramway employees hold two mass meetings, passing resolutions, one demanding the immediate dismissal of all woman labour, and another pledging themselves to support the Transport Workers' Federation in any action they may take to "secure equitable remuneration and grading periods for tramway workers."—London County Council Tramways Department decides to reinstate all the employees of military age who joined in the strike of 1915.—Mr. H. P. Stokes, of Bexley Heath, appointed general manager of Plymouth Corporation Tramways.

TUESDAY, AUGUST 26.

Newport Corporation Tramways Committee recommend adoption of a scheme for supplementary railless trolley route.

WEDNESDAY, AUGUST 27.

The Committee appointed by the Board of Trade to investigate Mr. Gattie's proposals for improving transport methods hold a meeting, and take evidence from Mr. Gattie.—Mr. A. Anderson, general manager of Oldham, Ashton, and Hyde Electric Tramway Company, transfers to British Electric Traction Company at Peterborough.—Inquest on the victims of St. Pancras tramway accident opened.

THURSDAY, AUGUST 28.

Inquest on victims of St. Pancras tramway accident resumed and adjourned till September 13.—Sunderland Corporation Tramways Committee decide to exchange running powers with the District Tramway Company.—Dundee Corporation Tramways Committee accept the proposal of the city engineer for extending car sheds at a cost of £9,000.—Stalybridge and District Tramways Board increase workmen's fares, and approve of a joint Whitley Committee for the electricity department.

FRIDAY, AUGUST 29.

Stoppage on Metropolitan District Railway through derailment of a carriage at Whitechapel.—Transport workers at Grimsby go on strike.—Reports from Manchester, Newcastle, Darlington, and other centres state that the tramway employees are holding mass meetings and passing resolutions endorsing the demands put forward by the Transport Workers' Federation.—The price of electric current supplied to Bolton Corporation Tramways Department by the Electricity Committee increased from 1·14d. to 1·36d. per unit.—Alderman James Bowes, chairman of Manchester Corporation Tramways Committee, receives congratulations and a present from his colleagues on his seventieth birthday.—Walthamstow Council propose to purchase eight tramcars from London United Tramways Company at £570 each.—Swindon Town Council decide to run tramway services on Sundays.—Darwen Tramways Committee decide that all who travel in workmen's hours shall be entitled to workmen's tickets.—Manchester Corporation Tramways Committee resolve to provide more shelters for tramway passengers.

SATURDAY, AUGUST 30.

Mr. C. W. Mallins, general manager of Liverpool Corporation Tramways, resigns on the ground of ill health, but the Tramways Committee requests him to withdraw his resignation, and offers instead three months' leave of absence.

SUNDAY, AUGUST 31.

Mass meetings of tramway employees held at Manchester, Birmingham, and other centres, pass resolutions affirming their determination to strike unless the demands to be submitted to the conference fixed for September 4 are conceded.

PATENT LIST.

Abstracted for "The Tramway and Railway World" from the Official Journal of Patents.

***** If the inventions have been communicated the names of the communicators are given in italics.**

APPLICATIONS FOR LETTERS PATENT.

The number of the patent is given in brackets.

Variable speed and accelerating devices (19,115)—F. W. Burgess and E. E. Sutton.
Transmission mechanism (18,771)—G. Cattaneo.
Speed transmission gearing (18,974)—J. Cotal.
Traffic controlling apparatus for railways, etc. (18,637)—R. G. Davey, H. H. Dyer and McKenzie, Holland and Westinghouse Power Signal Company.
Method of mounting and suspension springs for motor cars (18,719)—A. Deschamps.
Car spring attachments (18,720)—A. Deschamps.
Automatic coupling for tramway cars (19,046)—W. J. Evans.
Body for motor or rail vehicle (19,107)—E. W. Edwards.
Change speed gear (18,894)—H. C. J. Grant.
Motor vehicles (19,166)—W. R. Jones.
Automobiles (19,037)—E. Miles-Knolles.
Guards for motor omnibuses (18,709)—J. R. F. McCartney.
Wheel guards for motor vehicles (18,825)—J. T. Mead and M. Page.
Differential axles for motor vehicles (18,938)—E. Mepsted.
Shock absorbers for transmission gearing (18,670)—E. C. Middleton.
Trailer vehicles (18,706)—A. Mond (*Track Back Trailer Company*)
Variable speed gears for motor vehicles (19,116)—J. F. Phillips
Unpuncturable motor car tire (18,655)—H. Raistrick and A. E. Smith.
Variable speed gear (18,752)—S. Williams.
Variable speed gear (19,244)—H. P. H. Anderson and J. McCallum
Variable speed gear (19,328)—L. Bromfield.
Direction indicators (19,653)—H. G. Carradine.
Motor car brakes (19,507)—L. Delage et Cie.
Mechanical indicator for motor vehicles (19,532)—J. P. Huze.
Electric transmission mechanism (19,605)—D. B. Kinahan.
Motor vehicles (19,334)—C. E. Knight and G. F. Lovell.
Disc wheeel for motor vehicles (19,216)—J. Knight.
Lock for gear shift levers of automobiles (19,420)—A. E. McDonald
Transmission mechanisms for motor vehicles (19,248)—R. D. Nuttall Company.
Jack (19,399)—S. Percival (*Duff Manufacturing Company*).
Constant mesh change speed gear (19,341)—W. Pickard and D. R. Dobson.
Lifting jacks (19,299)—W. H. Sharpe.
Coal-gas producing plant for motor vehicles (19,213)—J. W. B. Stokes and C. J. Waldie.
Motor omnibuses (19,575)—D. G. Tanner.
Track rails (19,576)—E. F. Tilbury.
Means for driving and changing speed of motor vehicles (19,296)—T. J. Tresidder
Automatic clutch differentials for motor cars (19,602)—R. W. A. Warren.
Motor vehicle brake (19,553)—B. Williams.
Differential speed reducing gear (19,883)—C. F. Archer.
Means for regulating temperature of water jacket in motor car engines (20,173)—R. C. Black.
Rubber tires for wheels of motor vehicles (19,765)—J. Briggs.
Radiators for motor vehicle engines (20,205)—J. B. D. L. Chardard.
Control for variable speed gear (19,882)—J. W. Cookson.
Friction disc variable speed transmission gears (20,224)—P. Hanzer.
Omnibuses (19,867)—J. A. Hope.
Commutators for motor cars (19,994)—J. W. Law.
Vacuum brakes for railway vehicles (19,941)—E. S. Luard.
Crossovers of overhead conductors for electric traction (19,801)—E. M. Munro.
Transmission gear of motor vehicles (19,985)—E. J. de Normanville.
Means for lifting railway vehicles (20,115)—J. Rosenthal.
Automobiles (19,784)—A. A. Scott.
Variable speed transmission gear (19,754)—F. S. Smith.
Electric locomotives (20,202)—T. Zwergbergk.
Pneumatic power brake for vehicles (20,306)—F. A. F. Barnardo and S. D. Master.
Jacks (20,679)—H. I. Benedict.
Speed indicating devices (20,773)—F. S. Cotton.
Steering wheels for motor vehicles (20,350)—E. Crosse and E. Sellman.

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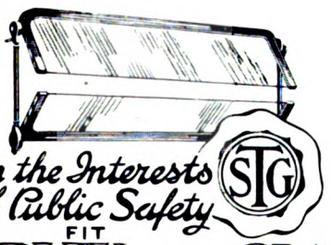
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Combination ignition switch for petrol-driven vehicles (20,384)—F. E. Ewer.
Variable speed gearing (20,648)—C. F. Gates.
Locking devices for automobiles (20,680)—G. P. Geraghty.

Specifications Published.

1917.

Removable bogies for trailers (13,023—*128,988*)—Schneider et Cie.
Control of transmission mechanism for heavy mechanically-propelled vehicles (13,611—*129,016*)—W. G. Wilson.
Life-saving device for motors (16,577—*129,662*)—A. F. Fretwell.
Electric signalling apparatus (17,011—*129,665*)—F. S. S. Wates.

1918.

Lifting jacks (7,088—*129,053* and 7,254—*129,055*)—F. L. Rapson.
Motor vehicles (9,100—*129,069*)—S. B. Weller and J. Weller.
Electric generator for motor vehicles (10,548—*117,263*)—J. Gambs.
Electric railway systems (10,687—*129,086*)—E. J. Patelski.
Control of electrically-propelled vehicles (10,857—*129,103*)—P. A. H. Mossay and Mossay and Company.
Change speed gear for motor vehicles (10,903—*129,106*)—G. Mansell.
Motor vehicles (11,131—*129,121*)—P. G. Hugh and G. Scammell and Nephew.
Brake mechanism for motor vehicles (11,133—*129,122*)—P. G. Hugh and G. Scammell and Nephew.
Motor wheels for vehicles (14,330—*118,847*)—C. M. Motte.
Tires of motor cars (11,146—*129,421*)—A. Watt.
Tramway rails (11,201—*129,427*)—S. Butler.
Temporary axle structures for motor vehicles (11,782—*129,462*)—A. E. Bentley and H. C. Bentley.
Speed indicators (11,853—*129,466*)—A. P. Japy.
Supporting apparatus for the rear axle of a motor car (13,299—*121,724*)—S. Tamura and M. Watanabe.
Points for tramways (20,950—*129,556*)—E. Allen and Company and E. Larmuth.
Driving mechanism for motors (8,337—*129,754*)—J. D. Allen.
Tipping bodies for vehicles (9,090—*129,755*)—G. E. Lloyd.
Insulated rail joints (18,243—*129,903*)—R. S. Proud.
Variable speed gear (19,061—*129,903*)—E. L. Firth.
Variable speed gearing (1,078—*130,089*)—Kingsland Research Syndicate and M. F. Torazzi.
Bodies of motor road vehicles (11,816—*130,127*)—W. Ivey-Rogers.
Rail chairs (12,015—*130,140*)—A. M. Bourke.
Train controlling systems (12,090—*130,151*)—W. J. Mellersh-Jackson (*E. P. Waterhouse and P. A. Prince*).
Driving apparatus for automobiles (12,161—*130,159*)—J. T. Roberts and L. Johnson.
Speed gears and disengaging couplings (12,742—*130,174*)—W. J. Gee.
Motor vehicles for road or rail (14,892—*130,200*)—C. Hyland.
Vehicle suitable as motor omnibus, tramcar, etc. (16,014—*130,215*)—J. Hardy.
Change speed gear operating mechanism for motor vehicles (16,274—*130,217*)—H. Dorrington.

1919.

Tramway signal (1,950—*129,217*)—C. H. Oldham.
Motor vehicles (7,740—*129,240*)—P. G. Hugh and G. Scammell and Nephew.
Railroad ties (10,371—*126,002*)—F. W. Woolever and G. M. Stains.
Joints of track rails (10,522—*129,616*)—J. Quinlan.
Electro-mechanical transmission systems for automobiles (64—*129,921*)—F. W. Howorth (*M. J. Huggins*).

LONDON COUNTY COUNCIL.

Applications are invited for the undermentioned positions in the Tramways Department :—

(1) Rolling Stock Engineer.—Commencing salary, £1,000, rising to £1,200 a year.

(2) Permanent Way Engineer.—Commencing salary, £800, rising to £1,000 a year.

(3) Assistant Electrical Engineer.—Commencing salary, £600, rising to £800 a year.

(4) Traffic Operation Superintendent.—Commencing salary, £600, rising to £800 a year.

(5) Traffic Statistics Assistant.—Commencing salary, £300, rising to £400 a year.

(6) Publicity Assistant in the Traffic Branch.—Commencing salary, £300, rising to £400 a year.

(7) Two Sub-Station Superintendents.—Commencing salary, £250, rising to £300 a year.

The salaries mentioned are based on pre-war conditions, and are subject to temporary war additions.

Except in the case of the Sub-Station Superintendent, appointments may be made at other than the minimum salary.

Applicants must have had good technical training and suitable experience for the positions they seek to occupy. Preference will be given to the candidates who have served or attempted to serve with H.M. Forces.

Applications must be made on the official forms, which may be obtained from the Clerk of the London County Council, County Hall, Spring Gardens, S.W.1. Applications must be received by 4 p.m. on Thursday, September 25, 1919. A stamped addressed envelope is necessary.—Canvassing disqualifies.

James Bird,
Clerk of the London County Council.

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TRAFFIC RETURNS.

Tramway and Omnibus Undertakings in the United Kingdom.

NAME OF COMPANY OR CORPORATION.	1918. WEEKS ENDED.					1919. WEEKS ENDED.					AGGREGATE.		
	Aug. 3	Aug. 10	Aug. 17	Aug. 24		Aug. 2	Aug. 9	Aug. 16	Aug. 23		Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Aberdare U.D. Council	506	636	620	526	...	559	664	619	543	...	20	10,983	+ 573
Aberdeen Corporation	2,848	2,899	3,075	2,804	...	3,755	3,746	3,851	3,931	...	11½	41,381	+ 9,136
Ayr Corporation	1,026	943	925	1,008	...	1,083	1,051	1,066	1,104	...	14	13,372	+ 1,882
Belfast City Tramways	8,403	8,367	8,372	8,587	...	10,374	10,827	11,063	10,309	...	21	216,331	+ 53,107
Birkenhead Corporation	2,453	2,621	2,406	2,377	...	3,050	3,185	3,365	3,276	...	20½	59,128	+ 12,664
Birmingham Corporation	24,016	24,527	23,529	24,305	...	24,966	24,878	24,962	25,548	...	21	536,059	+ 47,631
Birmingham Motor Buses	1,586	2,151	1,692	1,752	...	1,721	2,306	1,911	1,787	...	21	37,170	+ 4,420
Blackburn Corporation	2,504	2,245	2,172	1,927	...	2,565	2,132	2,489	2,478	...	21½	50,827	+ 10,840
Bradford Corporation	10,218	11,368	10,802	11,613	...	12,268	12,315	12,381	11,914	...	22	241,245	+ 48,440
Burnley Corporation	2,698	2,597	2,483	2,568	...	2,980	3,313	3,206	3,114	...	—	—	—
Burton-on-Trent Corporation	473	550	459	454	...	545	613	547	550	...	21	10,478	+ 1,754
Bury Corporation	2,285	2,381	2,519	2,484	...	2,317	2,560	2,653	2,497	...	19½	51,355	+ 6,999
Chatham and District	1,428	1,729	1,640	1,621	...	1,791	2,086	1,912	1,835	...	33	50,258	+ 6,902
Cork Electric	672	641	704	705	...	816	880	856	913	...	33	21,976	+ 879
Derby Corporation	1,653	1,864	1,631	1,646	...	1,921	2 206	2.066	2,123	...	21	40,456	+ 8 309
Dundee City	2,055	1,917	2,027	2 032	...	2,880	2,515	2,664	2,704	...	13½	36.005	+ 8,664
East Ham Corporation	1,704	1,867	1,782	2,081	...	1,907	2,155	1,984	1,850	...	20½	40,203	+ 8,285
Edinburgh Corporation	9,934	9,828	9,386	9,402	...	11,553	11,734	11,783	10,884	...	7½	96,690	+ 19,216
Glasgow Corporation	29,368	28,683	28,905	29,118	...	29,423	33,388	32,146	32,375	...	12	382,006	+ 39,412
Glossop (Urban Elec. Supply Co.)	190	218	184	216	...	212	235	246	214	...	34	7,536	+ 1,293
Halifax Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
Halifax Motor Omnibuses	...	...	...	...	...	...	...	...	...	...	—	—	—
Huddersfield Corporation	4,333	4,924	4,937	4,537	...	4,883	5,278	5 518	5,205	...	21	103,852	+ 22,851
Ilford U.D. Council	1,090	1,310	1,153	953	...	907	1,443	1,316	1,275	...	20½	25,546	+ 4,389
Ipswich Corporation	967	1,232	1,066	1,028	...	1,027	1,387	1,185	1,110	...	21	20 077	+ 3,285
Isle of Thanet	503	933	817	949	...	2,107	2,814	2,787	2,725	...	46½	37,502	+ 24,836
Kilmarnock Corporation	244	243	264	270	...	342	243	278	277	...	14½	4,194	+ 566
Lanarkshire	3,281	3,777	3,971	3,847	...	3,741	4,044	4,181	4,235	...	33	117,752	— 1,035
Leeds City	14,403	16,268	14,855	15,984	...	16,386	17,777	17,247	17,578	...	21	353,381	+ 79,361
Leicester Corporation	4,919	5,393	4,768	4,956	...	5,889	6,297	6,033	6,135	...	—	—	—
Leyton U.D. Council	2,600	2,855	2,659	2,747	...	3,169	3,666	3,295	3,184	...	21	66,889	+ 19,178
Liverpool Corporation	20,470	22,418	20,017	20,176	...	23,798	6,502	24,751	23,867	...	33½	727,141	+ 123,850
London County Council	69,574	72,646	69,325	75,316	...	80,213	87,136	80,969	79,198	...	20½	1,653,068	+ 347,777
Maidstone Corporation	291	394	331	324	...	390	527	441	443	...	20½	8.163	+ 2,128
Manchester Corporation	26,401	27,980	26,856	27,941	...	29,389	30,315	31,549	31,406	...	21	640,697	+ 108,903
Newcastle-on-Tyne Corporation	9,609	9,927	9,591	9,696	...	9,194	9,354	9,434	9,395	...	21	200,875	+ 10,614
New St. Helens and District	...	...	...	...	...	...	...	...	...	...	—	—	—
Northampton Corporation	865	1.201	921	857	...	1,263	1,683	1,363	1,352	...	20	27,207	+ 8,720
Nottingham Corporation	6 131	7,519	5,695	5,703	...	7,095	7,907	7,543	7,422	...	21	148,639	+ 26,843
Oldham Corporation	3,810	3,971	3,590	4,133	...	4,419	4,808	4,789	5,069	...	22	98,157	+ 20,358
Reading Corporation	1,423	1,695	1,575	1,500	...	1,649	1,893	1,760	1,728	...	20½	33,467	+ 6,058
Rhondda Tramways	...	...	...	...	...	...	...	...	...	...	—	—	—
Rotherham Corporation	2,513	2,756	2,677	2,629	...	2,032	2,044	1,951	2,042	...	20½	46,899	— 1,801
Sheffield Corporation	13,523	13,884	13,758	14,182	...	16,625	18,507	17,539	17,280	...	21½	369,801	+ 76,229
Southampton Corporation	2,748	2,958	2,976	2,940	...	2,514	3,367	3,026	2,897	...	20½	57,295	+ 4,050
Southend-on-Sea Corporation	1,736	3,004	2,953	2,747	...	2,930	4,226	4,322	3,996	...	21	49,325	+ 20,880
South Shields Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
Sunderland Corporation	2,216	2,453	2,258	2,263	...	2,958	3,616	3,453	3,197	...	21	62,339	+ 17,533
Swindon Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
Torquay Tramways	1,274	1,683	1,700	...	...	1,537	2,111	2,019	...	...	32	34,385	+ 6.037
Tyneside Tramways and Tramroads	1,247	1,471	1,323	1,282	...	1,077	1,477	1,458	1,441	...	8	9.335	+ 173
Wallasey Corporation	2,503	3,008	2,480	2,470	...	2,965	3,044	3,428	3,068	...	20½	56.271	+ 14.327
Walsall Corporation	1,261	1,708	1,266	1,340	...	1,330	1,644	1,353	1,459	...	21	29,381	+ 3,330
Walthamstow U.D. Council	1,646	1,914	1,792	1,206	...	1,765	2,184	1,915	1,822	...	21	37,785	+ 6,568
Warrington Corporation	770	835	788	767	...	873	955	878	914	...	20	18.096	+ 2,811
West Ham Corporation	4,881	5,420	4,939	5,743	...	5,227	5,752	5,326	5.184	...	20½	112,341	+ 19,486
Wolverhampton Corporation	2,354	1,903	1,746	1,661	...	2,343	2,072	2,207	2,055	...	21	43,336	+ 5,872

*** A number of undertakings suspended the issue of traffic returns for the duration of the war.

Colonial and Foreign Tramway Traffic Returns.

NAME OF COMPANY.	1918. WEEKS ENDED.					1919. WEEKS ENDED					AGGREGATE.		
	Aug. 3	Aug. 10	Aug. 17	Aug. 24		Aug. 2	Aug. 9	Aug. 16	Aug. 23		Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Anglo-Argentine	56,375	55,493	58,806	56,706	...	59,713	64,345	63,051	60,410	...	33	1,845,760	+ 18,425
Calcutta Rs.	78,852	80,888	83,212	79,930	...	87,955	89,484	90,400	86,392	...	33½	—	+377,046
Madras Rs.	...	...	...	...	...	...	...	...	...	...	—	—	—
Pernambuco	4,082	4,062	4,277	4,164	...	4,091	5,546	774	3,028	...	33½	171,361	+ 20,425

Companies issuing Monthly Statements only.

	1918.						1919.						Wks.	AGGREGATE.	
	March	April	May	June	July	Aug.	March	April	May	June	July	Aug.		1918-19.	+ or −.
	£	£	£	£	£	£	£	£	£	£	£	£		£	£
Ballarat & Bendigo	3,803	4,095	3,286	3,076	...	...	3,051	4,291	3,266	3,261	...	...	13	10,818	+ 361
Brazilian Trac. Mlrs	8094000	8330000	9030000	9087000	9465000	...	9330000	9208000	9562000	9369000	1007000	...	30	64,033,000	+4,875,000
Brisbane	35,530	35,530	...	...	36,360	...	39,380	38,775	...	...	41,610	...	30	262,155	+ 14,371
British Columbia $	510,892	515,417	486,876	488,873	...	...	649,120	631,988	628,947	411,605	...	...	52	7,062,559	+1,076,122
Buenos Ayres L'c'z.	42,647	41,643	41,315	38,375	41,145	41,817	47,370	43,607	47,317	61,356	45 222	46,846	9	92,068	+ 9,106
Burma	27,906	27,614	29,019	31,158	34,848	...	38,440	36,815	38,900	41,518	44,045	...	52	450,448	+ 115,668
Cape Town	...	19,011	...	17,612	...	...	...	22,564	23,405	22,432	...	...	—	—	—
Carthagena & H.	5,316	4,200	5,027	5,047	5,491	2,729	2,400	1,786	3,226	3,373	4,183	2,991	34	23,965	− 11,887
Cordoba	...	...	...	...	...	...	...	...	...	...	...	...	48	159,203	+ 11,492
East India	1,729	1,791	1,920	1,754	1,968	1,975	2,016	1,920	2,131	2,323	2.687	2,761	5	2,761	+ 786
Kalgoorlie	2,700	2,876	...	...	...	...	2,653	2,907	...	...	...	...	18	10,400	− 71
La Plata	5.348	5.169	5.105	5,135	6,721	...	6.592	5,630	5.702	5.105	5,317	...	31	39.774	+ 2,840
Lima	42,076	43,557	42,949	42,161	...	...	50,716	49,968	42,968	47,811	...	...	26	282,907	+ 26,682
Manaos Rs.	...	...	...	...	...	...	...	...	...	...	...	...	—	—	—
Manila $	172,750	163,500	175,500	183,250	...	...	207,792	212,638	183,050	160,670	...	...	26	1,207,412	+ 170,313
Monte Video	36,659	33,704	32,301	30.503	31,684	...	41,070	37,014	37,382	34,650	34,139	...	39	334,076	+ 33,551
Peruvian $	...	...	...	...	987,300	...	...	...	...	...	1058730	...	—	—	—
Para	24,848	24,745	24,925	25,445	24,398	...	26,022	25,342	24,503	24,647	24,659	...	34	196,736	+ 2,802
Port Elizabeth	...	4,028	...	5,404	...	...	...	5,576	5,145	4,868	...	...	—	—	—
Rangoon	5,955	5,885	5,719	6,163	6,054	5,760	7,533	6.217	6,533	6,276	6,562	6,472	35	51,660	+ 2,147
Toronto $	1113472	1065766	1090747	1035932	...	...	1083285	1051960	1032717	842,697	...	...	26	6,133,296	− 222,873
Winnipeg $	307,289	...	280,935	293,140	...	...	384,937	...	248,191	112,615	...	...	26	1,874,640	+ 63,302

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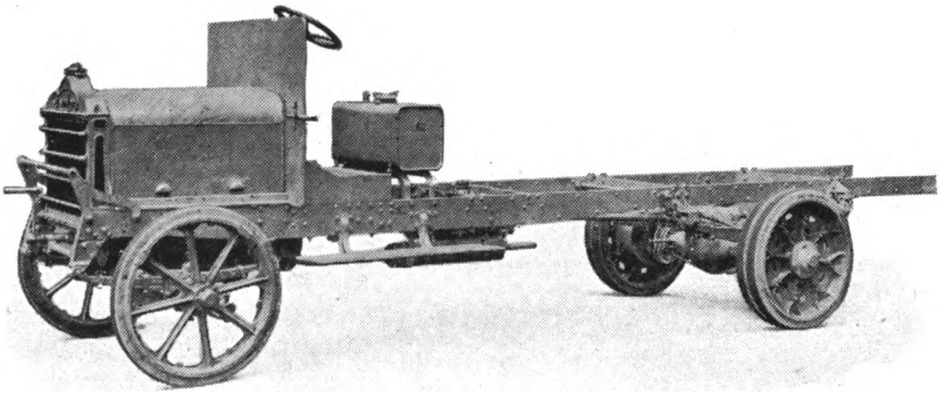

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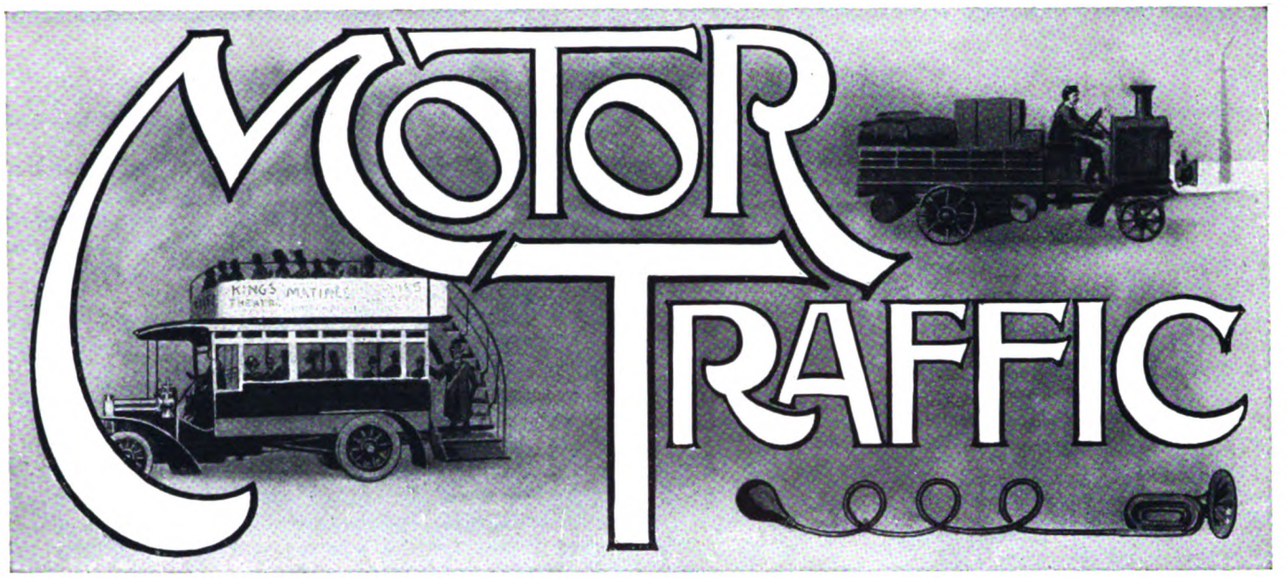

UNRESTRICTED IMPORTS.

It was hoped that the Prime Minister's statement as to the Government's commercial policy would have served to clear up many of the doubts at present existing. Unfortunately, however, it did not take us much further. We know that the restriction of imports by means of licensing is now abandoned, but no indication has been given of a really permanent policy to take its place. Thus we appear to be faced with a period during which unrestricted import of heavy motor vehicles is to be permitted without the payment of any import duty. This industry, which has deserved well of the country for its services during the war and has lost much valuable goodwill since 1914 through no fault of its own, is apparently to be given no assistance whatever to balance the handicap under which it unfortunately labours. It must begin again to fight for goodwill in markets where it was established before the war and from which it was temporarily excluded owing to national necessity, but incidentally much to the advantage of its foreign competitors. For the time being at any rate, import duty is, of course, levied upon foreign motor cars, but this duty does not apply to commercial motor vehicles. The fact that it applies to the one class and not to the other is nothing more than the result of an accident. The different treatment accorded to the two classes cannot possibly be justified in principle. Unstable key industries are to be given special consideration, but essential industries that have been rendered unstable directly on account of their utility in time of war are seemingly to have no consideration at all.

THE TRANSPORT ACT.

It is now possible to sum up the effect of the opposition against the Ways and Communications Bill, so far as it concerns road transport. It was never really anticipated that the Government would consent to exclude road policy and administration from the jurisdiction of the Transport Ministry. Short of this it may be claimed that considerable success has been achieved by the Motor Legislation Committee and its chairman, Sir W. Joynson-Hicks. It is provided that the Transport Minister is obliged to form a Statutory Roads Committee, the members of which will be appointed after consultation with the various authorities and interests. Thus it will not be merely a packed Committee of departmental nominees. This Committee has the right to consider and report to the Minister on any matter affecting the construction, improvement, or maintenance of roads or bridges, or the regulation of traffic thereon. It is not obliged to wait to be asked before considering any matter within its scope and reporting upon it. The Committee will elect its own chairman, and will make its own regulations, so that it will be able to meet as often as its pleases. The one important point upon which the Government proved adamant is the question of what shall happen to the Committee's reports. These, unfortunately, are to be made only to the Minister, the Committee having no right to report to Parliament. The Minister himself, however, must publish an annual report on road matters. In the House of Lords further amendments were introduced. Lord Montagu was successful in securing an amendment making the proposed classification of roads contingent upon previous consultation with the Roads Committee. The Minister is also obliged to establish a separate Road Department charged with dealing in the ordinary course of departmental business with road construction, maintenance, improvement, and development. Another minor, but important, point introduced during the last stages of the Bill gives omnibus companies a right to appeal to the Minister against the decision of any licensing authority which imposes vexatious or arbitrary conditions in connection with the grant of a license to ply for hire.

LONDON TRAFFIC.

The Select Committee on London Traffic certainly did not lack the courage of its convictions. Its report was very positive and very critical. From this report it becomes more than ever clear that one of the troubles from which we suffer is the division of responsibility among a large number of Government Departments and various authorities. Each department or authority looks at the problem from one particular angle or from some strictly limited point of view. One is concerned say with the economy of road maintenance. Another with the safety of the public. Another with the preservation of its own local dignity. It is everybody's business more or less, and therefore nobody's business in particular, to look at the whole problem taken together from the point of view of the economy and efficiency of transport. It is clear enough that the Committee was right in advising that there should be some central controlling body of workable proportions. The question of whether the exact type of body recommended is in fact the right one is more debatable, and

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MOTOR TRAFFIC

it may be that the reason why the Government is wasting valuable time before acting upon the Committee's report is serious doubt as to whether the exact method proposed for getting over the trouble will prove workable. The present state of affairs is admittedly extremely bad and one is apt to jump to the conclusion that people who point out existing faults which we acknowledge, and propose a remedy which seems plausible, are necessarily on the right lines. There is no question about the accuracy of what one may call the destructive side of the criticism. There is perhaps more question about the wisdom of the constructive side of the programme.

ABUSE OF THE ROAD.

Notwithstanding the high price of cars, motor cycles, and fuel, the number of machines now driven for pleasure threatens to increase at such a rate as to make locomotion on the roads around large centres decidedly unpleasant even to the motorist. This is especially the case on Saturdays and Sundays in the outer suburban districts of London and the country beyond, and, as we shall presently show, the deluge of tyros has made the roads unsafe for those leviathans the motor omnibuses. The greatest nuisance and danger arises from the new owners of motor cycles and side cars which have been discarded by the army. These are driven in total disregard of the regulation requiring the fitting of an effective silencer, with the result that there is a continuous noise of explosions, while the air is polluted with the fumes of fuel and of burnt oil arising from bad driving. On Sundays the number of vehicles is added to by the presence of newspaper delivery vans and of motor cabs whose drivers are on pleasure bent with their families or friends. Many of the newly-fledged "motorists" display utter ignorance or disregard of the rules of the road, to say nothing of failing to observe the courtesies of driving. These folk convert the junction of a side road with the main thoroughfare into a danger spot. Two instances of failure to recognise that main road traffic has the right of way were observed on a recent visit to Reigate. In one case a private car endangered an omnibus, causing the driver to make a dangerous swerve, a collision being averted by the car turning on to the grass. On the other occasion there was a similar incident in which two cars figured. The newspapers record that the following Sunday, in another district, a car turning out of a side road caused the driver of an omnibus to swerve to avoid a collision, with the result that the double-deck machine mounted the kerb and overturned, injuring 20 passengers. It is in the interest of efficient and considerate drivers that steps should be taken to stamp out these offences. Failure to do so will result in a demand for a compulsory examination in driving and in a knowledge of the rules of the road, before the issue of driving licenses. At present there is nothing to prevent a permit being obtained by a lunatic or by a person deprived of sight or hearing. Another common occurrence, and one which is an infringement of the law, is the spectacle of passengers in a private car taking the steering wheel and learning to drive before they have obtained a license. The obvious need of the age is that the motoring organisations should unite for the purpose of a "safety first" campaign through the medium of advertisements, in which the rules and courtesies of the road should be a predominant note. If such an effort to secure reform effects no improvement, the public will demand that all drivers of power-propelled vehicles shall undergo the same tests as are applied to candidates for licenses to drive public vehicles.

RAPID LOADING AND UNLOADING.

There are many reasons why the operating costs of motor vehicles should be higher than they were before the war. The vehicles themselves are more expensive, the drivers' wages are higher, petrol is dearer and so on. Under the circumstances it behoves users to consider whether or no there are any means by which they can make good this prospective loss of economy. Of course if our system was as nearly as possible ideal five years ago, there is not much more to be done. This, however, was not the case in the great majority of instances. In particular, owners of vehicles frequently permitted economy of operation to be very detrimentally affected by allowing a considerable part of the working day to be occupied in loading and unloading processes. We have heard traders blamed for some of the bad economy of the railways on the grounds that they make a practice of using railway trucks more as warehouses than as transport vehicles. There are plenty of cases where motor owners make the same mistake, directly to their own disadvantage. There are comparatively few cases in which the owner has gone thoroughly into the whole question of loading and unloading, and the provision of special bodies to accelerate these operations. Far more often than not the motor proprietor accepts some standard type of body provided by the manufacturer without questioning as to whether it is the best possible type for his trade. Probably he takes a type of body that is already used by other members of that trade and assumes that it must be right, forgetting that individual conditions differ in every instance. To some extent body builders are to be blamed for loading and unloading delays. They do not show any great amount of initiative in tackling this problem. The chassis manufacturer is inclined to favour standard types of body because these can be produced comparatively cheaply, which keeps down the first cost of the complete vehicle. The coach-builder, on the other hand, should be more of an individualist and should be out to show the user how he can economise in the long run by paying extra for a special type of body in the first instance. If half the working day is wasted loading and unloading while the vehicle is standing idle, then the operating costs per ton-mile carried are pretty certain to be at least 25 per cent. higher than there is any necessity for them to be.

THE EFFICIENT USE OF BENZOL.

Benzol is, of course, an easy fuel to use. Nevertheless like most things it can be used either efficiently or inefficiently. When it is substituted for petrol it will commonly be found that the carburetter needs some adjustment. Benzol ought to give a mileage about 20 per cent. better than that obtained with petrol. The exhaust should be clean, not showing any black smoke or giving a strong smell. If, when first used, the qualities indicated are not revealed, a somewhat smaller jet should be tried with a view to reducing the rate of flow of the fuel by about 10 per cent. The

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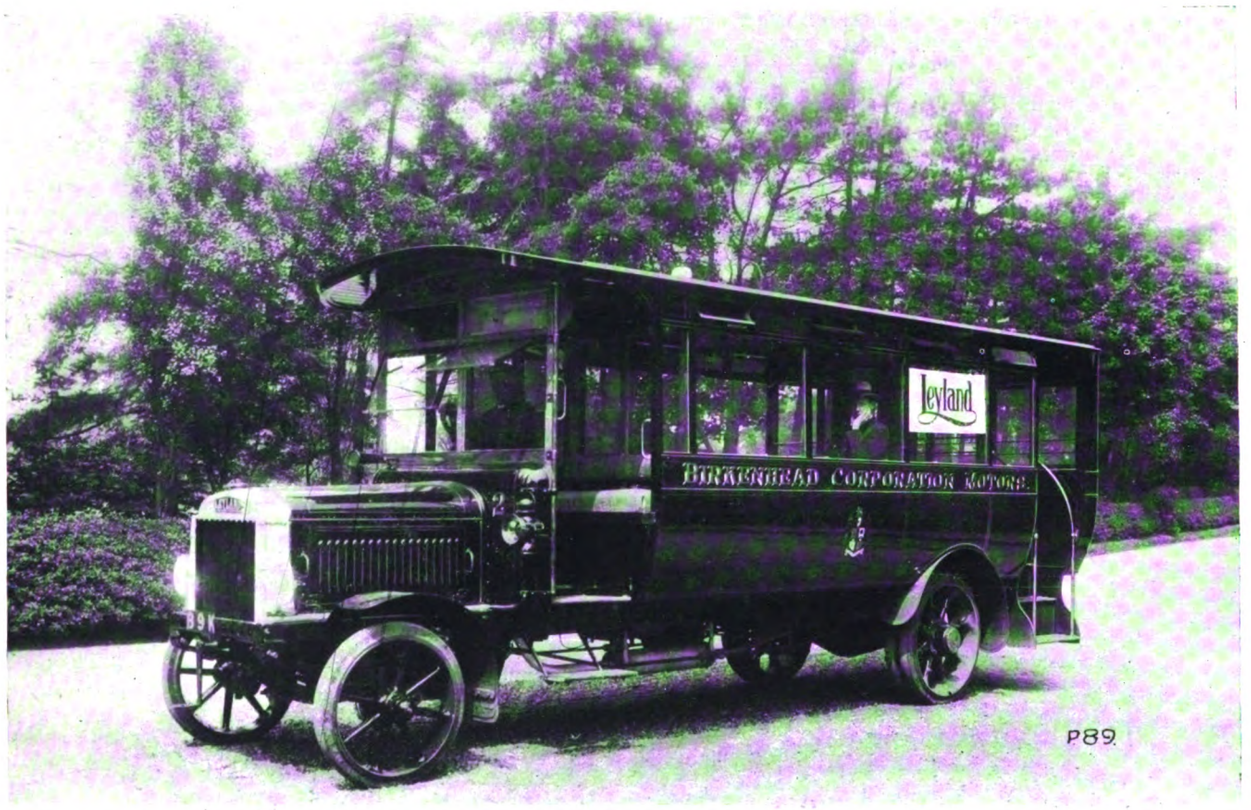
MOTOR TRAFFIC.

result of using the smaller jet should then be well tested on the road. If in a run of 50 miles or so the valve caps or plugs show any sign of sooting up, a further reduction in the jet aperture should be tried. An alternative is to provide for extra air supply. If this is done a slighter reduction in the size of jet will suffice. It is more economical to make the whole adjustment to the right degree by reducing the jet orifice. It is certainly in the interests of economy to pass the air supply to the carburetter through a heating muff. To assist very slow but steady running of the engine the weight of the carburetter float may be increased by about 20 per cent. by fitting a small metal washer on its top. If the consequence of this is to bring about flooding, the washer is too heavy. Cork floats are sometimes a nuisance with benzol which tends to dissolve the shellac with which they are coated. The best plan is to dry them thoroughly and then give two coats of liquid celluloid. Ordinary fish glue makes a fairly good substitute. Another tip making for economy is to disconnect the radiator fan in cold weather or to block part of the radiator so as to reduce its effectiveness. The reason for this is that benzol benefits in economy and efficiency if the engine is run at a higher temperature than would be advisable with petrol. A further point worth noting is that, when benzol is used, mineral lubricating oil should be preferred to any other oil, however good, that has an animal base. If the latter class of oil be used, it needs changing much more frequently than would be necessary if the fuel were petrol.

CORPORATION OMNIBUS SERVICES.

Alderman Dunsford, chairman of Southampton Corporation Tramways Committee, has stated that it is not the intention of the committee to encourage short rides on motor omnibuses. Such a policy would tend to introduce competition with the tramways. The omnibuses are intended to open up certain districts. For shorter rides passengers should take the cars. The committee have so far retained 1d. fares on the tramways, but there was no hope at present of 1d. sections being arranged on the omnibuses. "The financial position of the tramways," said the chairman, "was very serious."

BIRKENHEAD CORPORATION OMNIBUSES.—The omnibus services recently inaugurated by the tramways department of Birkenhead Corporation have met a long-felt want. There is no slack period in their running between Duke Street and Rock Ferry and Moreton, notwithstanding that the state of the roads is not conducive to smooth travelling.



These Handsome Leylands Achieved Instant Popularity.

Mr. W. Chamberlain, the general manager and engineer of Oldham Corporation Tramways, gives the following particulars of the working of the two motor omnibuses during the year ended March 25, 1919:—Gross capital expenditure, £3,380; traffic revenue, £713; total revenue, £716; working expenses, £1,627; income-tax, £4 10s.; deficiency, £914 16s.; miles run, 15,375; passengers carried, 120,319; percentage of working expenses to receipts, 226·91; average revenue per mile, 11·187d.; average expenses per mile, 25·397d.; average fare paid per passenger, 1·409d.

Gosport Council are considering the question of starting a motor omnibus service. At the last meeting of the Council it was decided to consider a scheme for running omnibuses in the town and outlying districts, which would be controlled by the Council. One councillor said that a service of omnibuses connecting up Stokes Bay, Lee-on-the-Solent, Alverstoke, and other places not touched by tramways, would, he was sure, prove very profitable. The scheme was referred to the Road and Works Committee.

Morecambe Corporation have started a service of single-deck omnibuses on the sea-front, for which purpose an order was placed some months ago for a number of new vehicles.

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MOTOR TRAFFIC

For the year ended March 31 last, the Eastbourne Corporation omnibus undertaking had a gross revenue of £14,809, as against £12,361. The total expenditure other than capital charges and other special expenditure was £13,806, as against £9,687. The gross profit was £1,002. Deducting capital charges, amounting to £623, there was a net profit of £379. There were nine Leyland omnibuses in service, and 2,370,000 passengers were carried, the miles run being 113,881. Passengers per omnibus mile averaged 20·81. The gross income per mile run was 32·62d., and the total cost per mile, including capital charges, was 31·82d., leaving a net profit of ·80d. per mile. For 1917-18 the net profit per mile was 5·06d.

PROPOSED MOTOR OMNIBUSES FOR YARMOUTH.—Yarmouth Town Council propose to apply for a provisional order authorising a service of motor omnibuses over the tramway and other routes.

MOTOR OMNIBUSES FOR STIRLING.—The directors of the Stirling and Bridge of Allan Tramways Company have been considering the question of mechanical traction. The original idea was to electrify the lines, but in the present abnormal conditions they have abandoned the idea of applying for Parliamentary powers, and they have placed an order for a number of motor omnibuses, which will be put on certain routes with a view to developing their business.

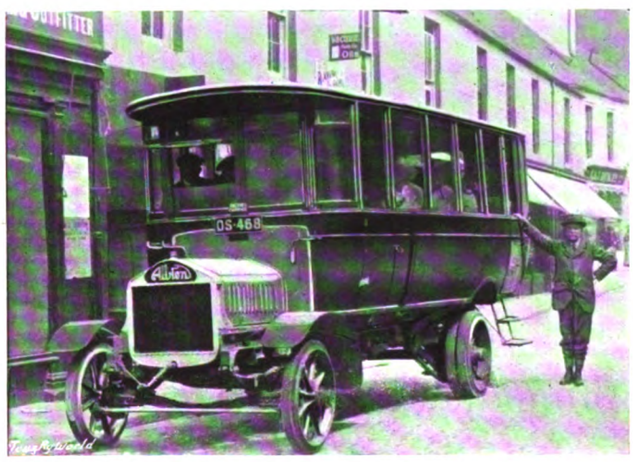
YORK CORPORATION MOTOR OMNIBUSES.—The accounts of the York Corporation for the year ending March 31 last show for the motor omnibus service an income of £3,135 9s. 9d., and an expense of £3,772 1s. 3d. The loss was thus £636 11s. 6d. Of £7,500 capital, £4,750 has been repaid. The working expenses per car-mile were 11·26d., compared with only 8·17d. the year before.

HALIFAX TRAMWAYS COMMITTEE have decided to purchase four motor omnibuses in order to open up a new route.

INTER-URBAN OMNIBUS ROUTES.

Now that the war is no longer devouring the products of British manufacturers of motor vehicles, the proprietors of inter-urban traction services are turning their attention to extending the facilities to enable rural residents to enjoy the amenities of civilisation. For several years before the war the single-deck omnibus had become the most popular institution in the countryside. It has been working a revolution in the outlook of the country folk and in bringing trade to both large and small towns.

With the re-populating of the country districts an object of achievement by the Government, the single-deck omnibus is bound to become an important factor, and it is already becoming prominent on the order book of the Albion Motor Car Company, Limited, of Scotstoun, Glasgow. One of these vehicles is shown in the accompanying photograph. The company's reputation both for passenger and goods vehicles has long been established. Both classes of machine added to their popularity in the service of the British armies during the war, and testimony to the same effect is now reaching the company from the oversea armies that fought in France. The company have every reason to be gratified at the very complimentary manner in which their vehicles were referred to in a recent report sent in to the Government of one of our Overseas Dominions.



Albion Omnibus for Urban and Rural Services.

ROTHERHAM TROLLEY & PETROL OMNIBUS COSTS.

A Rotherham Corporation return analyses the working costs of the trolley omnibus for the month of May, 1919, and the corresponding month a year ago as follows :—

Allocation.	Month ending May 30, 1919. Cost.	Per Mile.	Corresponding Month 1918. Cost.	Per Mile.	+ Increase. − Decrease.
	£ s. d.		£ s. d.		£ s. d.
Management	19 19 2	·512	16 7 7	·379	+ 3 11 7
Inspectors...	12 8 1	·319	14 13 1	·339	− 2 5 0
Motormen	117 9 10	3·017	68 1 7	1·578	+ 49 8 3
Conductors	90 19 10	2·337	49 7 6	1·144	+ 41 12 4
Car repairs	167 6 5½	4·297	101 4 5	2·347	+ 66 2 0½
Car cleaning	15 14 7	·403	18 5 2½	·423	− 2 10 7½
Car lubrication	40 3 6	1·031	14 15 0	·342	+ 25 8 6
Depot	8 9 9	·220	7 1 1	·163	+ 1 8 8
Overhead equipment ...	1 14 11	·044	—	—	+ 1 14 11
Tires	33 7 2	·857	35 2 2	·814	− 1 15 0
Road maintenance ...	12 4 11	·375	13 5 7	·375	− 1 0 8
Current	48 6 6	1·241	69 14 8	1·617	− 21 8 2
	568 4 8½	14·653	407 17 10½	9·521	+160 6 10

For the month of June the cost of running of the petrol omnibus is given as 14·653d. per car-mile. In June, 1918, the cost was 9·521d.

The Corporation has one petrol omnibus and the following is an analysis of operating costs of that vehicle for June :—

Allocation.	Month ending June 30, 1919. Cost.	Per Mile.	Corresponding Month 1918. Cost.	Per Mile.	+ Increase. − Decrease.
	£ s. d.		£ s. d.		£ s. d.
Management	15 17 9	·512	12 6 0	·379	+ 3 11 9
Inspectors...	9 17 9	·319	11 0 1	·339	− 1 2 4
Motormen	90 6 3	2·913	72 4 3	2·229	+ 18 2 0
Conductors	77 0 9	2·485	49 14 4	1·534	+ 27 6 5
Car repairs	59 19 7	1·935	59 13 1	1·841	+ 0 6 6
Car cleaning	12 7 9	·399	18 11 1½	·572	− 6 3 4½
Car lubrication	39 4 9	1·263	13 10 2	·417	+ 25 14 7
Depot	6 1 8	·220	5 6 0	·163	+ 1 9 8
Tires	27 19 9	·902	30 16 1	·951	− 2 16 4
Petrol	143 12 4	4·633	176 5 10½	5·442	− 32 13 6
	483 2 4	15·581	449 7 0	13·867	+ 33 15 4

PAPERS AT THE ROADS CONGRESS.

The list of papers to be submitted at the forthcoming Roads Congress to be held in London, under the auspices of the County Councils Association, is as appended :—

Thursday, November 20 (at an hour to be fixed).—Opening ceremony.

Friday, November 21, at 11 a.m.—"Concrete roads, their construction, maintenance, and life."

Friday, November 21, at 2.30 p.m.—"Asphaltic macadam (bituminous) roads and their extended use."

Saturday, November 22, at 11.30 a.m.—"The consolidation and amendment of the Highways Law."

Monday, November 24, at 2.30 p.m.—"The relative advantages of single and double coat road surfacing work carried out in bitumen (as distinct from tar compounds)."

Tuesday, November 25, at 11 a.m.—"The conditions under which the heavier types of vehicles may use the roads, with special reference to their liability for extraordinary traffic damages."

Tuesday, November 25, at 2.30 p.m.—"The weight, construction, and speed of mechanically-propelled vehicles in relation to the construction and maintenance of roads."; one paper to be read by a manufacturer of such vehicles and the other by a road engineer.

Wednesday, November 26, at 11 a.m. and 2.30 p.m.—"Provisions for and development of traffic in the future, with special reference to (*a*) the provision of new roads, (*b*) road finance, and (*c*) provision of new transport services."

ALCOHOL FUEL TESTS.—*Nature* states that the Inter-Departmental Committee on Power Alcohol has arranged with the London General Omnibus Company to run a number of motor omnibuses for six months on alcohol-benzol and alcohol-benzol-petrol mixtures, so that results may be obtained to compare with the running on petrol and other fuel. By the end of the year the Committee hope to be able to publish information that will enable the Government to take definite steps to render alcohol available for all motor users.

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WOLVERHAMPTON CHARS-A-BANC ACCOUNTS.

Included in the accounts of Wolverhampton Tramways Committee for the year ended March 31, 1919, is the appended comparative statement for two years of the fleet of motor chars-a-bancs which have been run for some years under the direction of Mr. Owen Silvers, the tramways manager and engineer. During the two years to which the accounts refer, the undertaking had to meet difficulties arising from the petrol restrictions and the difficulty of obtaining materials for maintenance. As the result of the latter trouble two of the fleet of eight vehicles were out of use for some time. Although in the past year there was a reduction in the miles run of about 4,000, there was an increase in receipts of £1,400, which was chiefly due to a revision of fares. The balance carried to net revenue account was £1,609, as against £2,189 for the preceding year.

EXPENDITURE.

	Mileage, 126,076. Average per mile run.	Year ended March 31, 1919.	Mileage, 130,132. Average per mile run.	Year ended March 31, 1918.
	d.	£ s. d.	d.	£
OPERATING COSTS—				
Fuel	4·437	2,330 13 11	4·498	2,439
Wages of drivers and conductors (including war bonus)	3·348	1,759 2 0	2·292	1,242
Ditto, oilers and cleaners	·506	265 19 3	·327	177
Oil, grease, and sundries	·595	312 12 5	·272	148
Tickets, way bills, etc.	·145	76 8 3	·086	47
Uniforms	·179	94 5 2	·087	47
Wages of clerks in ticket office	·140	73 18 10	—	—
Miscellaneous	—	—	·005	3
	9·350	4,912 19 10	7·567	4,103
GENERAL CHARGES—				
Management and clerical staff	·240	126 9 9	—	—
Proportion of salaries of town clerk's and borough accountant's staffs	·037	19 10 0	—	—
Rents	·044	23 4 6	—	—
Rates (£455 13s.); licences (£36 10s. 7d.)	·937	492 3 7	·049	27
Insurances—Fire, £10 5s. 10d.; third party, £333 0s. 5d.; employers' liability, £12 0s. 4d.; health, £10 8s.; aircraft, 14s. 9d.	·698	366 9 4	·331	179
Printing and stationery	·001	0 11 6	·003	2
Management expenses, loans fund	·027	14 3 10	—	—
	1·984	1,042 12 6	·383	208
MAINTENANCE, REPAIRS, ETC.—				
Chassis	·929	487 18 3	·693	376
Bodies	·271	142 1 1	·436	236
Tires	·594	311 16 11	·390	212
Depreciation of chars-a-bancs	1·838	965 3 9	1·371	744
	3·632	1,907 0 0	2·890	1,568
Bank interest	·228	119 11 0	·119	64
	15·194	7,982 3 4	10·959	5,943
Balance carried to net revenue account	3·064	1,609 12 11	4·038	2,189
	18·258	9,591 16 3	14·997	8,132

INCOME.

	d.	£ s. d.	d.	£
TRAFFIC RECEIPTS	18·258	9,591 16 3	14·997	8,132

A.E.C. WAGONS FOR BREWERS.

The vehicles shown in the illustration at the foot of this page comprise a portion of an order for thirteen vehicles placed with the Associated Equipment Company, Limited, of Walthamstow, E.17, by Messrs. Truman, Hanbury and Buxton. A number of the vehicles have been in service for some time, and the owners report that the machines are proving thoroughly satisfactory.

AUSTRALIA IN NEED OF LORRIES.

A communication from the offices of the Commonwealth of Australia, Australia House, Strand, London, W.C.2, states that there is a large and growing demand for motor lorries and farm tractors in the Commonwealth. Makers are recommended to communicate at the above address with Mr. J. A. M. Elder, who is in England on a special commission from the Federal Government to inquire into the question of the establishment of new industries in Australia.

WAR OFFICE PETROL STOCK.

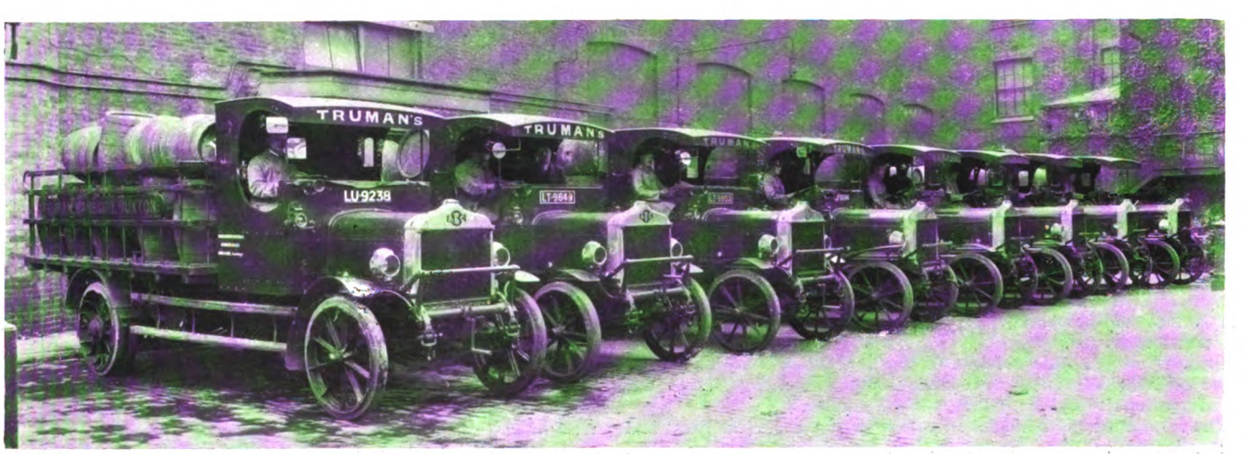
Mr. Churchill has stated in a written reply to Mr. R. Gwynne that on July 1 last 110,000 tons of motor spirit or petrol were held by the War Office. The estimated monthly consumption is 14,000 tons. The stock held was accumulated to meet the requirements of the armies in the field, and no reduction could justifiably be made until after the signing and ratification of the Peace Treaty. The future estimated requirements of the army had been under review, and any surplus stock will be released as early as possible.

WORKING COSTS OF A G.V.

The following figures are given by Mr. W. A. Walker, electrical engineer to Kettering Urban Council, of the working of a 3½-ton G.V. wagon with an iron-excide battery, during the year ended March 31 last :—

	£	s.	d.
Depreciation, 10 per cent. on chassis, less battery and tires—i.e., on £780	78	0	0
Increase at 5 per cent. on decreasing capital, or 2½ per cent. on £780	20	0	0
Current, 5,958 units at 2d. per unit	50	0	0
Tires (4,392 miles)	17	0	0
Battery upkeep	100	0	0
Insurance	13	0	0
Wages (driver and mate)	410	0	0
Repairs, oil, etc.	97	0	0
	£785	0	0
Tons of coal carted	6,839		
Tons of clinker carted	1,263		
	8,102		

The mileage covered was 4,392, and the cost per ton of the material carried was 1s. 11d. During the two years the machine has been in operation it has not been out of commission a day.



Part of a Brewery Fleet supplied by The Associated Equipment Company.

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MOTOR TRAFFIC

MOTOR TRANSPORT YEAR BOOK.

Apart from the value of the numerous routine features, the "Motor Transport Year Book and Directory"—the fourth issue of which is to hand—contains articles and data that insure the attention of the reader. Of the 1919 volume as a whole we can reiterate what has been said in these columns before, namely, that it is indispensable to all concerned in the management or administrative work of public passenger vehicles.

Matters of present and future importance are dealt with by Mr. E. S. Shrapnell-Smith, C.B.E., in the three introductory pages. Observing that there are enormous arrears to be caught up on existing orders for chars-a-banc and omnibuses, he states that the London General Omnibus Company are seeking to place a total of 4,000 vehicles, half of these being in supersession of existing types. To satisfy the public demand within an area of only 12 miles from Charing Cross, probably 6,000 omnibuses will be required, either at the hands of existing companies alone, or in conjunction with the London County Council before the end of 1921. Country undertakings will account for another 2,000 by the spring of 1921. A third branch, which is showing healthy signs, is the development of omnibus services in connection with electric traction undertakings. The order for 100 omnibuses, given by Liverpool Corporation Tramways Department, is an outstanding feature.

A census of the leading provincial tramway undertakings might well show that orders have been placed, or are on the point of being placed, for about 1,500 omnibuses. A particular case of more than usual interest is that of Edinburgh, where the Corporation Tramways department is reported to be on the point of giving an extensive trial to high-powered omnibuses, with 8-cylinder engines, developing about 70 H.P. An incidental circumstance here will be the question of adopting, on account of the hilly nature of the area, a rubber tire with a co-efficient of friction higher than is usually found. It may prove to be economical to follow the practice of the London Fire Brigade in using a high grade rubber tire, with a section having walls sloping outwards towards the base.

ROAD RESTRICTIONS—FUEL—OMNIBUS LINKS WITH RAILWAYS.

Referring to the difficulty confronting users and intending users of omnibuses in the continued operation of Section 20 of the Local Government Board (Emergency Provisions) Act, 1916, by its inclusion in the Ministry of Ways and Communications Act, Mr. Shrapnell-Smith observes that the Act grants certain rights of appeal over the heads of the local authorities, which will provide a measure of safeguard for promoters. Unless, however, the new Ministry creates precedents which differ essentially from the practices of other departments, the position will remain obscure, and the development of public passenger transport will be handicapped.

Dealing with the fuel position, the writer affirms that it is likely to become much easier during this year, and that many companies will be used as the dumping grounds for the large stocks of war benzene, which will be exhausted by October next. Adverting to the work of the Alcohol Fuel Committee, he refers to the test which is being made by the London General Omnibus Company wholly upon duty-free alcohol mixed with an equal volume of benzole. The results of this trial should prove of far-reaching importance.

Refusing to endorse the gloomy forebodings sometimes heard in regard to the increased cost of labour, the author looks upon the recent agitation about increased fares as being due almost entirely to public irritation over the insufficiency of service resulting from war heritage. He is convinced that the self-contained omnibus, which serves the worker during the week and can be diverted at week-ends and on holidays to recreative areas, will prove superior to all rivalry, mechanical or political. With Brigadier-General Maybury at the head of the Roads Transport Department of the Ministry of Ways and Communications, the writer believes that the industry will have intelligent treatment, and that the threat of unfair tolls will disappear.

The volume gives full information regarding 486 companies and corporations authorised to engage in motor transport business, the list comprising 303 companies, 74 municipal bodies, and 109 private firms. Last year the total number was 395. The number of manufacturing enterprises has risen from 300 in the first volume to 470 limited liability companies. The geographical index gives the names of the motor transport undertakings according to the districts served.

Included in the other sections of the Year Book is a directory of 3,000 officials connected with motor transport undertakings and allied manufacturing companies, with addresses.

The volume is obtainable not only from its publishers (the Electrical Press, Limited, Fisher Street, W.C.1), but from agents in India, New York, Australia, New Zealand, Canada, South Africa, and Paris.

THE SEAT INDICATOR.

USEFUL INVENTION BY A LONDON AND SYDNEY FIRM.

The omnibus and tramway car seat indicator, illustrated below, has been designed and perfected to obviate the delay and confusion which are often present owing to the public being unable to see the number of vacant seats at the top or outside of these vehicles.

It is well known that persons waiting on the kerb cannot see the number of seats vacant at the top of the vehicle, particularly after dark. The conductor, too, owing to the frequent interchange of passengers while he is inside, is often uncertain on this point. The result is that when the vehicle draws up a number of persons make a rush for the outside, with the consequence that several of them find that they have to descend again. This causes confusion all round and much delay. It is a common sight in London to see an omnibus held up owing to the block in the gangway due to the uncertainty as to the number of vacant seats outside.

By the use of this indicator the number of seats vacant is at all times clearly shown in bold figures, and if no seats are vacant the figure 0 appears on the dial. If the figure 6 is shown on the indicator and three persons ascend the stairs the figure 3 immediately appears. Similarly, if the figure, say 5, is shown on the dial, and two persons descend the stairs, then the figure 7 is immediately indicated.

From the standpoint of the omnibus or tramcar owners the following points are of some importance:—It frequently happens

The Ball Seat Indicator.

on boarding an omnibus that the passenger is directed inside by the conductor, he being under the impression that the outside is full, but inside passengers who have gone up to the outside (after another person has come down) have found not only one seat vacant but sometimes two or three, thus showing that the conductor was mistaken. If this happens on the average only once per day the loss in potential fares is at least 30s. per annum, but in all probability the loss is very much higher.

Then again, a passenger goes to the top while the conductor is inside, and he does not come up to collect the fare, doubtless because he is unaware that another passenger has got on. Of course the fare should be tendered before alighting in this case, but a great many fares must be lost in the course of a year in this way. The indicator will prevent mistakes of this kind, and will materially assist in the efficient working of omnibuses and cars, apart from the undoubted convenience which it affords to the public, for they give the conductor a reliable check on the number of outside passengers.

The instrument is strongly constructed, is of simple design, and may be fixed at any convenient position adjacent to the stairway, or if preferred it can be placed flush in the rise of one of the steps. The mechanism within the indicator is of the simplest character, strongly designed, and cannot get out of order. It is operated by a slight movement of an iron tread on two of the steps. The device was perfected by Mr. G. F. Ball, of 4, Featherstone Buildings, High Holborn, London, and 88, Pitt Street, Sydney.

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MOTOR TRAFFIC

STREET TRAFFIC REGULATION.

The Commissioner of Police of the Metropolis informs us that a committee appointed by him has been sitting at New Scotland Yard to consider the powers and duties of the police in relation to the regulation of traffic in the streets on other than special occasions, in what manner those duties shall be promulgated in simple terms for the guidance of the police, and the advisability of uniform rules for traffic regulation throughout the Metropolitan Police District.

In their report the committee lay special stress on the necessity for signals to be codified and issued as instructions to drivers. The code of signals suggested is as follows :—

FOR MOTORS.

(All signals to be given on the right-hand side of car, and in ample time to be of use.)

Right forearm vertical	Stop.
Right arm horizontal	Turning to right.
Right arm horizontal and then swept to the left	Turning to left.
Right arm horizontal, palm of hand down, and moved slowly up and down	Slow down.
Right arm waved low from rear to the front	Pass.

FOR HORSE DRIVERS.

Whip rotated above head	Turning.
Whip raised vertically	Stop.

It is obvious that one code only is possible owing to the confusion that would arise were duplicate signals admissible.

GOVERNMENT CARS.

In the House of Commons a few weeks since, Mr. Bonar Law stated that 17 cars were allotted to the use of Ministers. In the cars used by Government departments there had been a considerable reduction, and he hoped shortly to inform the House of the way in which the use of the remaining cars would be dealt with.

On August 16, Captain Guest announced that in a few days the use of over 500 cars would be withdrawn from the military in the United Kingdom.

Sir J. Norton Griffiths asked the Secretary for War if he was aware that a King's messenger left Paris daily by motor car for Havre with War Office bags, which were due at the War Office at 10.30 or thereabouts the following morning, each journey costing, with wear, tear, and driver's wages, some £20 or more ; and whether a more economical method of transmission could be found.

Captain Guest : A night service, involving the use of a car on the French side, is at present maintained, as it is the only way by which despatches can leave the Peace Delegation at night and be received and dealt with in London the following morning, and *vice versa*. A considerable part of the cost is offset by the saving which can be effected in the telegraph bill. The despatches are not only for the War Office, but also for the Cabinet and other Government departments.

Mr. Bonar Law stated on August 18 that Ministers of the Crown had decided to give up at once the use of cars allotted to them.

POSITIONS AT OLYMPIA SHOW.

The draw for positions at the Motor Car Exhibition at Olympia, which opens on November 7, has resulted in the positions in the centre of the building being secured by the following firms :—

Arrol-Johnston, Austin, Belsize, Calthorpe, Clement-Talbot, Daimler, Darracq, de Diétrich, de Dion-Bouton, Delaunay-Belleville, Donne and Willans, Enfield-Allday, Fiat, Gladiator, Hollingdrake, Automobile Company, Humber, Iris, Jarrott and Letts, Lanchester, London and Parisian Motor Company, London Motor Garage Company, Minerva, Napier, Panhard et Levassor, Rawlence and Company, Renault, Rolls-Royce, Rover, Sheffield-Simplex, Armstrong-Siddeley, Standard, Straker-Squire, Sunbeam, Swift, Turner, Vauxhall, Vulcan, Willys-Overland, and Wolseley.

The next best positions go to the Grégoire, Newton and Bennett, and Star, followed by the Jackson, Phœnix, Lancia and Vinot. Then come the Angus-Sanderson, Briton, Delage and Peugeot, the Cadillac, Delahaye and Unic, the Bayard, Brasier, Crossley and Seabrook, the Sizaire-Berwick, General Motors Limited, Hillman, and Isotta-Fraschini, Hertford Motor Company, Bianchi, Guy Motors Limited, Grahame-White Company, Riley, T. B. Andre and Company, Adam, Grimaldi and Company, and the Hampton Engineering Company. There will also be 23 exhibitors in the carriage builders' section, 103 in the accessories section, and 20 who will show tires or wheels.

LONDON-PARIS AIR SERVICE.

The London-Paris air service was successfully inaugurated on August 18, three aeroplanes leaving London on that day. Two of the machines were an Airco 4 and an Airco 16, and the third a Handley-Page equipped with twin Rolls-Royce engines. Both the Airco machines were also fitted with Rolls-Royce 275-H.P. engines, and their speed was about 120 miles an hour. One machine made a return journey. Leaving Hounslow at 9.10 a.m., it arrived in Paris at 11.40 a.m., and leaving again on the return at 12.40 p.m., reached Hounslow at 2.45 p.m. The other two made the journey in good time. The fare is 15 guineas for a single journey. Parcels and luggage are carried, but not mails, as the post office fear that the service will not be sufficiently reliable.

10,000 MILES BENZOL TRIAL.

Under the auspices of the Automobile Association a new 16 H.P. Sunbeam car started from London, on August 28, for a 10,000 miles run on benzol fuel. After visiting Scotland, the chief towns of England are being called at, the car performing daily out and home runs from various centres. The Institute of Automobile Engineers has appointed Captain E. Arter as an independent observer to accompany the car throughout its journey ; Captain R. H. Montgomery, the Association's fuel expert, is also acting as an observer. The daily runs are from 180 to 200 miles, and the trial will end on September 17th.

Before the commencement of the trial there was a careful examination of the engine, and at the end of the test the parts are to be dismantled to inspect their exact condition. All clearances of moving parts are checked before and after the trial, so that any undue wear will be observed. Samples of the lubricating oil are taken at intervals for the purpose of analysis, thus enabling the effect of the fuel upon the lubricant to be ascertained.

The following towns are being visited, as provisionally arranged in the order in which they are given : Leeds, Edinburgh, Inverness, Glasgow, Harrogate, Darlington, Newcastle-on-Tyne, Manchester, Liverpool, Birmingham, Newport, Cardiff, Gloucester, Northampton, Bedford, Newmarket, Norwich, Peterborough, Coventry, Newport again, Chester, Oxford, Salisbury, Brighton, Chichester, Basingstoke, Guildford, Tunbridge Wells, and Exeter.

LIGHTS ON VEHICLES.

WITHDRAWAL OF RESTRICTIONS.

In view of the recent revocation of the Lights (Vehicles) Order and the Lights (Driving of Animals) Order, the Commissioner of Police of the Metropolis issued a memorandum early in August showing the provisions of the law as it now exists on the subject of lights on different vehicles. The principal items are as follows :—

LIGHT LOCOMOTIVES (MOTOR CARS).—One lamp must be carried on the extreme off-side free from all obstruction to the light, and it must be lit between one hour after sunset and one hour before sunrise, and show a white light to the front and red to the rear. During similar hours a lamp should be kept burning so as to illuminate the identification mark fixed on the back of the vehicle.

PUSH BICYCLES AND TRICYCLES.—Pedal cycles have to carry a light between one hour after sunset and one hour before sunrise.

PUBLIC CARRIAGES.—Stage carriages must have a lamp inside properly lighted between sunset and sunrise. Cabs must carry between one hour after sunset and one hour before sunrise a lamp properly trimmed and lit so as to exhibit a white light to the front. If only one lamp is carried it should be on the off-side.

HORSE-DRAWN VEHICLES.—One lamp showing a white light to the front must be carried between one hour after sunset and one hour before sunrise. If there is only one lamp it must be on the off-side and any light visible from the rear must be red. If there are loads projecting more than 6 ft. to the rear, the vehicle must have a lamp showing red to the rear. County Councils have power to make orders exempting vehicles used for the purpose of harvesting from the provisions of the Act. The Act does not apply to any vehicles drawn or propelled by hand.

In connection with the withdrawal of the lighting regulations for vehicles under the Defence of the Realm Act, it is stated that representatives of motoring interests intend to raise the question of adding to the Lighting of Vehicles Act a clause requiring pedal cycles, hand-carts, and horse vehicles to display a rear red light.

The London "Safety First" Council have entered a protest against the withdrawal of the regulation covering the provision of a red rear light on vehicles and cycles. In the opinion of the Council the regulation now withdrawn contributed to the safety of the public.

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MOTOR TRAFFIC

ADAPTING ROADS FOR OMNIBUSES.

LEGISLATIVE IMPOSITIONS ON MIDDLESBROUGH AND STOCKTON.

The Clerk to the Durham County Council has reported that the result of the Council's opposition to the Bills of Middlesbrough and Stockton Corporations may be considered highly satisfactory. By the Council's opposition the principle of a local authority which is authorised to run omnibuses on roads outside its area contributing towards the cost of adapting such roads has been, he believes, for the first time established, and the mileage rate of 1¼d. is higher than has yet been inserted in any other Bill, and, indeed, the same House of Lords Committee, in respect of the same Bill, only gave the North Riding County Council a mileage rate of 1d., and allowed nothing in respect of adapting the roads.

When the two Bills came before the House of Lords Committee, Middlesbrough refused to withdraw their tramway and railless trolley car proposals, and declined to offer any contribution towards the adaptation of the roads for the purposes of motor omnibus traffic, but intimated that it would be prepared to pay ¾d. per omnibus mile to the road authority in respect of its motor omnibus traffic. The House of Lords Committee, however, struck out the tramway and trackless trolley proposals, and decided that Middlesbrough must share with Stockton the cost of adapting the roads over which it is proposed that both Corporations shall run omnibuses, or a third of the cost if Stockton does not run, and that Middlesbrough shall pay to the road authority 1¼d. per omnibus mile run in respect of the various roads.

Stockton-on-Tees withdrew their tramway proposals, and all the defined omnibus routes, on condition that Durham County Council and Stockton Rural Council would give their permission to the omnibus routes upon the following conditions :—

(*a*) That Stockton Corporation contribute one-third of the cost of making the roads over which it is proposed to run omnibuses suitable for such traffic (such third not to exceed £5,000) ; and

(*b*) Stockton Corporation to pay to the road authority 1¼d. per omnibus mile run subject to revision under certain circumstances.

West Hartlepool Corporation have withdrawn from their Bill the tramways provisions which affected the roads under the control of Durham County Council, and have also agreed to similar provisions, so far as their powers of running omnibuses are concerned, as were imposed on Middlesbrough Corporation.

OBLIGATIONS IMPOSED UPON WALSALL CORPORATION.

Reporting to Walsall Rural Council on the result of their opposition to the motor omnibus clauses of Walsall Corporation Bill, the clerk stated that the Corporation offered £275 a mile towards the cost of adaptation of roads, and three-eighths of a penny per omnibus mile for upkeep. The contribution for upkeep had been increased to three-farthings, and for adaptation to £700 a mile.

TWOPENCE PER OMNIBUS MILE.

On condition of the payment of 2d. per omnibus mile, Oxfordshire County Council have sanctioned the institution of four new omnibus routes. Lancashire County Council, in consenting to several omnibus services, have stipulated that the vehicles shall run along routes defined on a plan to be supplied by the county surveyor, and that 2d. per vehicle mile shall be paid to the Council, together with an initial fee of one guinea per annum ; that a journey book be kept by the applicants in which the journeys made each day are to be recorded, with the number of passengers, such book to be open to the inspection of the county surveyor or his agent.

ORGANISATION OF BUSINESS MOTOR USERS.

With the interests of road motor users now definitely placed under the control of the Ministry of Ways and Communications, the need for organisation of those affected has been accentuated. Lancashire is alive to this necessity, as shown by a meeting of the North and East Lancashire Commercial Motor Users' Association on August 6 for the purpose of forming a north-western division. This will cover the area of the late Road Transport Board, and is intended to secure closer co-operation in the interests of business motor transport users. The following commercial vehicle users were elected on the Divisional Committee :—Messrs. J. Cromble-holme (Preston), C. le M. Gosselin (Preston), R. Houghton (Preston) D. Prattley (Burnley), and J. E. Mallalieu, A.M.I.E.E. (Blackpool).

OMNIBUSES AND RAILLESS CARS.

CONTRIBUTIONS FOR ROAD MAINTENANCE.

The question of payments for road maintenance and adaptation by local authorities running motor omnibuses and railless trolley cars is referred to in a report issued in August by the Select Committee on Local Legislation. Walsall Corporation and Cannock Urban Council, the report states, obtained special powers to run omnibuses outside their areas, subject to the following payments to road authorities :—

(1) For reconstruction of roads not yet adapted to motor traffic a sum not exceeding £700 per mile of road adapted.

(2) For maintenance of all roads run over three farthings per omnibus mile. Provided that no payment for adaptation, reconstruction, or maintenance shall be made unless the road is actually reconstructed or adapted, and is kept in suitable repair for the running of the omnibuses.

Both these authorities were made subject to the condition that their power should lapse if at the expiration of five years they should not be using their powers so as to satisfy reasonably the public need.

The Committee direct attention to the points raised in their report of 1914 as to the anomaly of making municipal authorities contribute to upkeep and reconstruction and not making private enterprise do the same. The question of reconstruction and adaptation of roads, particularly main roads, to the needs of modern traffic grows in urgency, says the Committee, and should be dealt with as a matter of national importance, and not in separate local Bills, as is now the case.

The report of 1914 dealt with the proposals of the Sheffield Corporation to run motor omnibuses outside its area subject to the payment of three-eighths of a penny a mile for the first three years, and subsequently half the extra cost of road upkeep due to the motor omnibuses of the Corporation, provided that : (1) The payment shall not exceed three-eighths of a penny per car-mile for any road that has not been adapted to mechanical traffic ; (2) that no payment shall be made for reconstruction, for widening, or for any other purpose but upkeep ; (3) that if an Imperial grant is made for upkeep of any road concerned, payment shall be diminished or shall cease accordingly.

The Committee add that prior to their 1914 report they had expressed the opinion that "an authority should be constituted to decide which roads should be the main roads of the country, and that the cost of their maintenance should be taken off the rates and put upon the taxes," and the 1914 report said the question had become so urgent that there should be no further delay in arriving at a principle that would apply to the whole country.

The present report recalls that in 1914 both Houses of Parliament agreed : "That it is desirable that a Joint Committee of both Houses be appointed to inquire and report as to the present law relating to the running of motor omnibuses and trolley vehicles under statutory powers and otherwise ; whether any amendment is necessary with respect to the control to be exercised by local authorities ; and what contribution, if any, should be payable towards the cost of road maintenance by the proprietors of such vehicles."

Owing to the outbreak of the war the proposed inquiry was not arranged for.

LONDON OMNIBUS FACILITIES.

INCREASE OF 667,000 IN DAILY CARRYING CAPACITY.

Since the armistice in November last the carrying capacity of the vehicles run by the London General Omnibus Company has been increased 40 per cent., which is equal to an addition of 667,000 passengers daily. The increase in the number of vehicles is 709. In November, 1918, there were 1,758 omnibuses running, as compared with 2,467 in July, 1919. The mileage has increased by 74,097—from 199,240 to 273,337. The majority of the additional vehicles are omnibuses returned from war service in France, and lorries taken over from the War Department. The running of the latter machines involves the company in a weekly loss of £1,500, according to a statement presented to the Select Committee on London Traffic by Mr. H. E. Blain, the operating manager of the Underground Group.

During the past few months the company has trained and placed in its service 773 ex-soldiers as drivers, and 978 as conductors, while nearly 800 men are now undergoing instruction. Of the 10,033 employees who enlisted, over 6,000 have returned up to August.

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MOTOR TRAFFIC

MOTOR VEHICLES FOR MUNICIPALITIES.

MALVERN URBAN COUNCIL have ordered a motor lorry.

MIDDLETON CORPORATION are obtaining a motor lorry.

REDCAR URBAN COUNCIL have ordered a motor fire engine.

THURLESTONE URBAN COUNCIL are purchasing a steam lorry.

BECKENHAM URBAN COUNCIL propose to purchase a motor wagon.

YARMOUTH CORPORATION have purchased two 5-ton steam wagons.

BOGNOR URBAN COUNCIL have decided to purchase two motor lorries.

SOUTHPORT CORPORATION have decided to obtain a motor tipping wagon.

LOWESTOFT RURAL COUNCIL have ordered a Garrett steam tipping wagon.

BOSTON RURAL COUNCIL have purchased a car for the use of the surveyor.

PENRITH RURAL COUNCIL are considering the provision of a motor fire engine.

WESTON-SUPER-MARE COUNCIL propose to purchase a motor fire-engine.

HULL HEALTH COMMITTEE have purchased a second-hand Belsize car for £750.

DUNDEE CORPORATION contemplate the purchase of further motor vehicles.

CAMBRIDGE COUNTY COUNCIL have purchased a tractor for the road department.

TYNEMOUTH COUNCIL have applied for a loan for the purchase of four motor wagons.

SWANSEA CORPORATION have decided to seek powers to instal a motor omnibus service.

LEEDS CORPORATION have authorised the purchase of a Lacre road sweeping machine.

WEST HAM CORPORATION have agreed to purchase a motor pump and three motor vehicles.

DURHAM COUNTY COUNCIL have bought ten Foden steam wagons from the War Department.

KIDDERMINSTER TOWN COUNCIL have under consideration the purchase of a motor wagon.

CHARD RURAL COUNCIL are placing an order for tractors and tipping wagons for road work.

PAIGNTON URBAN COUNCIL have asked for sanction to a loan for the purchase of a motor fire engine.

WEST HAM BOARD OF GUARDIANS require two motor ambulance carriages, complete with all fittings.

CARNARVONSHIRE COUNTY COUNCIL have agreed to the surveyor hiring or purchasing motor vehicles.

HARROGATE TOWN COUNCIL have under consideration a recommendation to purchase a motor wagon.

CHORLEY COUNCIL have received sanction for obtaining a loan for the purchase of a motor fire engine.

LANCASTER TOWN COUNCIL have decided to purchase a 5-ton steam wagon for use in the highways department.

RAWTENSTALL COUNCIL have applied for sanction for the raising of a loan for the purchase of a motor fire engine.

BOLTON GAS COMMITTEE have referred the question of the purchase of a motor lorry to the chairman and vice-chairman.

THE LONDON COUNTY COUNCIL have placed an order with Leyland Motors, Limited, for a motor lorry for use with the fire brigade.

HULL WORKS COMMITTEE have purchased three tractor trailer wagons for 158 guineas at a sale of Government vehicles at Liverpool.

THE CORPORATION OF THE CITY OF LONDON have decided to purchase a motor car for the use of the officials of the streets department.

CALCUTTA CORPORATION are purchasing nine motor lorries fitted with cranes and two trailers. The vehicles are to be used for refuse collection.

ELECTRIC VEHICLES FOR PRESTON.—Preston Town Council have secured permission for a loan of £2,657 for the purchase of two electric vehicles.

WESTMINSTER CITY COUNCIL have accepted the tender of Wood-Milne, Limited, for the supply of ten sets of solid rubber tires at £55 17s. per set.

COVENTRY CORPORATION have decided to provide a motor omnibus service, and have placed an order with the Associated Equipment Company for the necessary vehicles.

HAMMERSMITH BOROUGH COUNCIL have received a report from a committee appointed to consider the replacing of horse haulage by motor vehicles, recommending the purchase of two steam wagons.

ILFORD COUNCIL have instructed the surveyor to investigate thoroughly a proposal entirely to substitute mechanical haulage for the horse haulage now used for the collection and disposal of house and street refuse.

MORECAMBE TOWN COUNCIL have started a motor omnibus service. The vehicles, which are of the single-deck variety, with seating accommodation for 30 passengers, are being supplied by Tilling-Stevens, Limited, of Maidstone.

ACCRINGTON CORPORATION were informed in the annual report of the sanitary department that the cost of collecting refuse by horse-drawn vehicles was 3s. 9·2d. per ton; by electrical vehicle, 3s. 11·3d. per ton; by petrol motor, 3s. 3·8d. per ton.

ROTHESAY CORPORATION TRAMWAYS COMMITTEE have recommended the purchase of four chassis at £990 each from the Associated Equipment Company, of Walthamstow, and four omnibus bodies at £500 each from Messrs. James Bartle and Company, of London.

GLASGOW WORKS COMMITTEE recommend the purchase of a Clayton compound steam motor tractor for the sum of £1,164, less 10 per cent., along with two 5-ton end-tipping trailer wagons, made by the Bristol Wagon and Carriage Works Company, Limited, at £190 each.

SHEFFIELD'S NEW MOTORS.—Sheffield Corporation Cleansing Committee have decided to purchase three Edison electric vehicles at £1,304 each; an electric vehicle at £1,200 from Messrs. R. Garrett and Sons, Limited; a 3½-ton electric vehicle for £1,340 from the General Vehicle Company, Limited; and a four-wheeled drive petrol wagon for £1,100 from Messrs. A. T. Bennett and Company.

BRIGHTON CORPORATION have under consideration an offer from Tillings, Limited, to take a lease of the Brighton and Hove omnibus powers for a period of seven years on the conditions that the company pay to each of the Brighton and Hove Corporations the sum of £40 per vehicle up to the minimum number of fifty, and £20 for each additional omnibus licensed. The lease to be operative as from July 1, 1919.

TOTTENHAM URBAN COUNCIL have received a report from a committee who visited Westminster, Hackney, Hornsey, and Leyton to gather information as to the working of motor vehicles for road cleansing and haulage. On the recommendation of the committee the Council have placed orders for two steam wagons with Messrs. Mann, two petrol motor water vans with Messrs. Thornycroft, and six electric dust wagons with Edison Accumulators, Limited.

ELECTRIC VEHICLE PROGRESS.

SURBITON COUNCIL are purchasing an electric dust wagon.

HESTON COUNCIL propose to purchase three electric vehicles.

LLANELLY COUNCIL propose to purchase four battery-propelled wagons.

PRESTON CORPORATION intend to purchase two Edison electric vehicles.

WILLESDEN COUNCIL intend to purchase an electric battery vehicle at a cost of £1,100.

OLDHAM CORPORATION have applied for sanction to a loan for the purchase of an electric vehicle.

RUSHDEN URBAN COUNCIL have decided to purchase an electric wagon for dust collection for £1,250.

TOTTENHAM COUNCIL have given an order for six electric dust wagons to Edison Accumulators, Limited.

MERTHYR TOWN COUNCIL have decided to purchase an electric battery wagon for the collection of refuse.

NEWPORT (MON.) Corporation propose to purchase three electric wagons for refuse collection in place of eight horses and vans.

LANCASTER TOWN COUNCIL have appointed a small committee to consider the advisability of installing an electric omnibus service.

SOUTH SHIELDS COUNCIL have received sanction to obtain a loan for the purchase of plant for a charging station for electric vehicles for refuse collection.

GLASGOW TRAMWAYS COMMITTEE propose to purchase two 5-ton electric vehicles from Electromobile (Leeds), Limited. The Cleansing Committee have decided to purchase six vehicles from Edison Accumulators, Limited, for £1,304 each, if the firms agree to pay a penalty at the rate of £20 for each machine for each week or part thereof during which any of the machines remain undelivered after the dates of delivery as specified in the contracts.

SHEFFIELD CLEANSING COMMITTEE propose to place the following orders for vehicles for refuse collection:—Edison Accumulators, Limited, three 2-ton electric tipping wagons, at £1,304 each; Richard Garrett and Sons, Limited, one 2½-ton electric tipping wagon, at £1,200; General Vehicle Company, Limited, one 3½-ton electric tipping wagon, at £1,340; A. T. Bennett and Company, one 3-5 ton four-wheeled drive petrol wagon, at £1,100.

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MOTOR TRAFFIC

LORRIES FOR GOODS TRAFFIC.

ARRANGEMENTS BY THE MINISTRY OF TRANSPORT TO RELIEVE CONGESTION.

Under the direction of Sir Philip Nash, the head of the traffic department of the Ministry of Ways and Communications, a scheme has been prepared for the use of army motor lorries in order to relieve the congestion in railway goods traffic. It is proposed to work through central and local administration as was the case with the Ministry of Munitions during the war. The whole country is to be divided into districts, with subsidiary depots in charge of transport officers, who will daily consider the question of supply and demand, and keep in touch with the central office by telephone.

During the existence of the Road Transport Committee of the Board of Trade, which has now lapsed, an extensive scheme of lorry transport was inaugurated in a number of industrial districts, with the co-operation of the area officials of the Ministry of Munitions, but the new project is to be on a more extensive scale. It is to be worked in conjunction with the railway companies, who will supply the labour, while the vehicles will be supplied by the Government. By this means it is anticipated that considerable relief will be afforded to the railways in dealing with the transport of food and of materials for manufacturing centres. Owing to the large number of railway trucks and locomotives that are still retained in France and other war areas, and also because of the difficulty of the companies obtaining materials for the manufacture and repair of rolling stock, railway congestion is likely to continue for an indefinite period.

With Sir Philip Nash at the head of the organisation, the project will be vested with the powers appertaining to the Ministry of Ways and Communications, which will thus have a unique opportunity of proving its utility. Sir Philip is well suited to undertake the task, for besides his long experience as locomotive engineer to the Great Northern Railway Company he was deputy-director general of transportation to the British Expeditionary Force in 1916.

For some months motor lorries have been in use at Liverpool for the conveyance of goods between the docks and the industrial centres of Lancashire and Yorkshire, and the work has proved so successful that a demand has been put forward for the allocation of 500 more lorries for the Liverpool traffic. In London there are to be a number of depots established, each of which has asked for 50 lorries. This number is likely to be greatly exceeded, for at the London Docks alone there is a shortage of 5,000 railway wagons. It is anticipated that in a very short period the new transportation scheme will have an appreciable effect in enabling industries to respond to the national call for increased production.

INDUSTRIAL TRAFFIC CONGESTION.

The Joint Industrial Council for the Road Transport Industry is interesting itself in the present serious traffic congestion, particularly at the London Docks. The Council, which consists of representatives of the Motor Transport Employers' Federation, the National Alliance of Commercial Road Transport Associations, and the National Union of Horse and Motor Owners' Associations on the employers' side, and the National Transport Workers' Federation and its affiliated unions on the employees' side, has interviewed the Government departments dealing with the matter, and is prepared to place the organisation at the disposal of these departments to assist in relieving the congestion as expeditiously as possible.

HONOURS FOR MOTOR OFFICIALS.

Mr. W. Joynson-Hicks, M.P., has been made a baronet in recognition of his public services. The new baronet is chairman of the A.A. and M.U., and legal adviser to the C.M.U.A. He took the lead in the Parliamentary opposition to the road traffic provisions of the Ways and Communications Bill, and was instrumental in securing a number of concessions. He was also the chief exponent of the movement that led to the constitution of the Royal Air Force as a separate establishment.

Mr. Julian Orde, secretary of the Royal A.C., has been created a knight. During the war Mr. Orde was the chief worker in extending the hospitality of the Club to officers of the Services.

MOTOR TRAFFIC NOTES.

CHARS-A-BANC SERVICE AT CHELMSFORD.—The National Steam Car Company have been licensed to run motor chars-a-bancs at Chelmsford.

OMNIBUSES AT GLASGOW.—Mr. J. McConville has been granted a licence by the Glasgow Magistrates' Committee to run motor omnibuses between George Square and Kirkintilloch.

GRANTS BY THE ROAD BOARD.—Up to July 31 grants, aggregating for the whole of the United Kingdom £9,100,000 in the present year, have been allocated by the Road Board out of the sums placed at its disposal for road and bridge repairs.

PETROL SUPPLIES IN SCOTLAND.—Owing to the shortage of petrol supplies in Scotland, the National Benzol Association has forwarded consignments of benzol, and the petrol companies have informed the Royal Scottish A.C. that the position is being hourly improved.

MOTOR TRANSPORT IN GUERNSEY.—For the purpose of running omnibuses, haulage of goods, dealing in motor vehicles, and undertaking repairs, the Guernsey Motors, Limited, has been registered. As a first step it is proposed to place 20 chassis in service, suitable for both omnibus and lorry bodies.

LONDON—SOUTH COAST CHARS-A-BANC SERVICE.—Under the auspices of the Queen Motor Transport Company, of Greenwich, a chars-a-banc service leaves Lewisham, S.E., at 8.30 a.m. daily for Hastings, Eastbourne, and Brighton. On Thursdays there is a half-day run to Tunbridge Wells and back.

OMNIBUSES FOR STIRLING.—The Stirling and Bridge of Allan Tramways Company have been considering the question of mechanical traction. The original idea was to electrify the lines, but in the present abnormal conditions the directors have placed an order for a number of motor omnibuses, which will be put on certain routes with a view to developing the business.

A BIG COMMERCIAL ORDER.—It will be noted with interest that Messrs. C. A. Vandervell and Company have secured a very large order from the Karrier Company, of Huddersfield. This eminent firm of motor lorry builders have decided to fit the C.A.V. lighting set as a standard upon every chassis turned out from their works, the arrangement commencing in the new year.

SPLASHING REGULATION FOR HEAVY MOTORS.—On October 1 next the following order issued by the Local Government Board will come into operation :—" Every heavy motor car used on any highway shall be fitted with a device so constructed and fixed and of such a character as will prevent mud or water being thrown by such heavy motor car upon any person or property, or upon any other vehicle."

AN OPENING FOR BRITISH VEHICLES.—Sir E. L. Brockman, Chief Secretary to the Government of the Federated Malay States, reports that there is certain to be an increased demand for motor transport, and it is desirable that British manufacturers should study local conditions. In 1918 there were 43 motor omnibuses, as against 129 in 1914, but lorries had increased from 54 to 83, the majority coming from Great Britain.

ORDERS FOR THORNYCROFT VEHICLES.—A statement issued in connection with a meeting to authorise an increase of the capital of John I. Thornycroft and Company, Limited, shows that the orders for lorries taken since the armistice have averaged 66 per week, while the average deliveries have been 22 per week. The value of the orders received during that period is approximately £2,000,000, and quotations are now being given for deliveries during the next two years. The directors propose to extend the works at Basingstoke.

WITHDRAWAL OF THE GAS PROHIBITION ORDER.—The Board of Trade have given notice that the Gas (Use in Motor Vehicles) Local Prohibition Order, 1918, ceased to have effect as from August 18. The Order limited the use of gas as a motor fuel to public utility services operating north of the southern boundary of Durham and Westmorland. Except as a matter of history the cancellation is of no interest, for with other fuels now everywhere available the demand for gas has ceased.

THE DUNLOP RUBBER COMPANY are introducing a new motor tire, which will be known as the Dunlop Type Magnum. The tire has a moulded non-skid tread of very rough rubber, which it is claimed will enable it to retain the pattern for a much longer period than the ordinary non-skid type. The Dunlop Magnum tire is made only in standard sizes, and will be manufactured in the company's new works now being erected at Fort Dunlop. No orders can be accepted for the Dunlop Magnums at present, but the company will at the earliest moment announce the sizes first available.

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THE
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SATURDAY, SEPTEMBER 13, 1919.

LIFTING JACKS FOR TRAMCARS.

Tramway cars are not designed to carry a large equipment of tools, but there is ample room under the inside seats in which to stow a few of the implements required in emergency. During the past few weeks, coroners' juries have had unpleasant cause for commenting on the fact that tramway cars often do not carry lifting jacks, and advising the authorities concerned to remedy the defect. When, by unfortunate accident, a person knocked down by the car is missed by the lifeguard, the body of the victim becomes wedged under the vehicle. To extricate the body, the car must be lifted clear. Only the other day it was reported in the daily press that, in order to extricate the body of a child which had been run down, a large number of men had to be called in to assist in lifting the car. In another case the body of a woman was under a tramcar for several hours before means could be obtained for raising the heavy mass of the vehicle. These facts are known to everyone connected with the tramway industry, and it may be said that to mention them is superfluous, but when the action which should follow upon knowledge is not taken, a strong reminder seems to be necessary. Such occurrences have a very bad effect upon the public mind. If tramway authorities are unable to devise lifeguards and brakes which shall be fool-proof, it is obviously good policy to render the effects of unavoidable mishap as inconspicuous as possible. A tramcar blocking up the traffic on a line, with an injured, dying, or perhaps dead human being under it for any considerable period of time arouses a feeling of indignant disgust not easily allayed. Some tramway authorities have taken heed, and equipped their cars with jacks, but an appreciable number still neglect the provision. To put jacks into a fleet of several hundred tramcars involves a considerable expense, but the question of cost would not be important if it were not the feeling that the occurrences which require their use are, or ought to be, very rare, prevails in the minds of tramway managers and officials. It is not callousness, but rather a kindly optimism which hinders the installation of the appliances. If such an accident has happened, it is hoped that it will not occur again. Provision of jacks after the event will not help, and precautions to avoid accident are redoubled, so that the need does not seem urgent. Time and again it has been shown, however, that human stupidity is invincible, and will get round all possible protective devices and precautions into danger. Tramway authorities who are not convinced of the necessity might save themselves from much anxiety and risk of undeserved obloquy by installing jacks on some, at least, of the tramcars on each route of their systems. The expense is not great, and the precaution might avert considerable loss of popularity.

WHITLEY COUNCIL FOR THE TRAMWAY INDUSTRY.

CONSTITUTION ADOPTED AND OFFICERS ELECTED.

The first meeting of the National Joint Industrial Council for the Tramway Industry, which has been in course of formation during the past year, was held at the Ministry of Labour on September 5. At this meeting the draft constitution of the Council was submitted and approved, and the officers were elected. The constitution was amended slightly, and now stands as follows :—

OBJECTS.

To secure the largest possible measure of joint action between Employers and Employees by the regular consideration and settlement of matters affecting the well-being and progress of the industry, as part of the national life.

It will be open to the Council to take any action that falls within the scope of this general definition. Among its more specific objects will be the following :—

(*a*) The establishment and definition of functions of District Councils and Works Committees. (*b*) The consideration of measures for the inclusion of all Employers and Employees in their respective organisations, and for securing the observance by them of collective agreements. (*c*) The regular consideration, and, where possible, determination of Wages, Hours and Working Conditions which affect the industry as a whole. (*d*) The consideration of machinery for the settlement of differences between the parties and sections in the industry. (*e*) The consideration of measures for securing regular employment, while providing the public with the most efficient service. (*f*) The improvement of conditions with a view to removing danger to the health of the workpeople and minimising accidents. (*g*) The consideration of safeguarding the rights of workpeople inventing or designing improvements in machinery and method. (*h*) The training for the industry and co-operation with the educational authorities in arranging education in all its branches for the industry. (*i*) Inquiries into special problems of the industry, including the study of the organisation and methods of the industry in this and other countries, and, where desirable, the publication of reports. (*j*) The collection of statistics and information on matters appertaining to the industry. (*k*) Representation to any appropriate authority of the needs and opinions of the industry in respect of any matters affecting the constitution and continuance of the Undertakings and the material well-being of all concerned in the industry. (*l*) The consideration of any matters that may be referred to it by the Government or any Government Department. (*m*) The consideration of problems of reconstruction and labour resettlement arising out of the war, in so far as they affect the industry. (*n*) Co-operation with the Joint Industrial Councils for other industries and other bodies to deal with problems of common interest.

CONSTITUTION.

1.—MEMBERSHIP. The Council shall consist of 44 *Members*, representative of the industry, being 22 Representatives of the *Employers* and 22 Representatives of the *Employees*.

Employers' Representatives.—The Representatives of the Municipal Tramways shall be 14 in number and be elected from :—(*a*) Members of Tramway Committees &/or (*b*) Officers of Tramway Departments.

The Representatives of Tramway and Light Railway Companies shall be 8 in number and be elected from :—(*a*) Directors of Tramway or Light Railway Companies &/or (*b*) Officers of Tramway or Light Railway Companies.

Employees' Representatives.—The representatives of the employees shall be 22 in number. *Note.*—The National Transport Workers' Federation have undertaken to secure that all the employees on the traffic staffs and the semi-skilled and unskilled men engaged in other branches of the industry shall be represented on the employees' side of the Council.

2.—RE-ELECTION. The members of the Council shall retire annually, and shall be eligible for re-election.

3.—COMMITTEES. The Council shall have power to appoint from its own members, Executive and other Committees, and to determine the powers of such Committees. Unless otherwise agreed, such Committees shall be equally representative of both sides of the Council.

4.—OFFICERS. The Officers shall consist of a Chairman, a Vice-Chairman, a Treasurer, and a Secretary or Secretaries. The Chair-

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man and Vice-Chairman shall be elected from the members of the Council; when the Chairman is a representative of the employers, the Vice Chairman shall be a representative of the employees, and *vice versa*. The Council shall be empowered to appoint a Treasurer, a Secretary or Secretaries, and the necessary staff, and shall be empowered to pay them such remuneration as it may think fit.

5.—MEETINGS OF THE COUNCIL. The ordinary meetings of the Council shall be held as often as necessary, and not less frequently than once a quarter. A special meeting shall be called on the requisition of at least one-third of the Council. At least seven days' notice of such special meeting shall be given, and the business of the meeting stated in the notice.

6.—VOTING. The voting shall be by show of hands or otherwise, as the Council may determine.

All resolutions shall be regarded as carried if they have been approved by a majority of the members present on each side of the Council, subject to the following exceptions:

As regards any matter falling within the scope of (*k*) and (*l*) of the objects, or any matter not included in the specific objects, or any variation of the constitution of the Council under clause 9 hereof, no resolutions shall be regarded as carried unless they have been approved by (*a*) a majority of the employers' members present representing the Municipal Tramways; (*b*) a majority of the employers' members present representing the Tramway and Light Railway Companies; (*c*) a majority of the employees' members present.

A decision as to whether a matter does fall within the scope of (*k*) or (*l*), or is not included in the other specific objects mentioned, may be demanded by any two members of the Council, and shall be decided by the Chairman of the Council. In the event of the decision of the Chairman on this point being dissented from by any two members of the Council, the question shall be referred to the President, for the time being, of the Board of Trade, whose decision shall be final.

7.—QUORUM. Not less than one half of the representatives of each side of the Council shall constitute a quorum.

8.—FINANCE. The administrative expenses of the Council shall be met by the two sides of the Council in equal proportion.

9.—AMENDMENT OF CONSTITUTION. The Council shall have power from time to time to amend or add to the above constitution in such a way as it may think fit, subject to confirmation by the constituent Associations of the respective parties.

DISTRICT COUNCILS.

FUNCTIONS.—The main functions of the District Councils shall be as follows:—1. To consider any matters that may be referred to them by the National Joint Industrial Council, and to take executive action within their district in connection with decisions arrived at and matters deputed to them by it. 2. To make recommendations to the National Joint Industrial Council. 3. To consider any matters of interest to their district, including matters referred to them by Works Committees, and to take executive action with regard to matters that affect only their particular district, subject to the right of the National Council to veto any such action if it be found to involve the interests of other districts. Among the more specific functions falling under this head are:—(*a*) The regular consideration of hours, wages, and working conditions, including the codification, unification, and amendment of working rules relating to holidays, juvenile labour, overtime, the shift system, etc. (*b*) The co-ordination of local working conditions. (*c*) General district matters relating to the well-being of the workpeople. (*d*) The consideration of safeguarding the rights of workpeople inventing or designing improvements in machinery and method. (*e*) The improvement of conditions with a view to removing danger to the health of the workpeople and minimising accidents. (*f*) The training for the industry and co-operation with the educational authorities in arranging education in all its branches for the industry. 4. Co-operation with the District Councils for other industries to deal with problems of common interest. 5. To consider any differences which cannot be settled within an individual undertaking, and, if necessary, to refer the same to the National Council. 6. No executive action shall be taken upon these matters if such action is likely to involve the interests of other districts.

CONSTITUENCIES. *Areas of District Council.s*—It is suggested that the areas of the District Councils shall be as follows:—(*a*) Scotland. (*b*) Northern Area. (*c*) Lancashire, Cheshire and North Wales. (*d*) Yorkshire, Lincolnshire and North Derbyshire. (*e*) South Wales. (*f*) Midlands Area. (*g*) Metropolitan Area. (*h*) South-West and part of South Coast Area. (*i*) East, South-East, and part of South Coast Area.

The following officers were appointed:—

CHAIRMAN: Mr. W. J. Squires, Chairman of the Highways Committee of the London County Council.

VICE-CHAIRMAN: Mr. Stanley Hirst, Amalgamated Association of Tramway and Vehicle Workers.

JOINT SECRETARIES: *Employers.*—Mr. J. Beckett, F.S.A.A., general secretary of the Municipal Tramways Association, Gothic House, Accrington; Mr. A. de Turckheim, secretary of the Tramways and Light Railways Association, 33, Tothill Street, Westminster, S.W.1. *Employees.*—Mr. J. Cliff, Amalgamated Association of Tramway and Vehicle Workers, 5, Leaf Square, Pendleton, Manchester.

This is the forty-sixth Joint Industrial Council to be formed, and the fifth council dealing with industries in which both municipal and company-owned undertakings are concerned.

MUNICIPAL TRAMWAYS ASSOCIATION

ANNUAL MEETINGS.

The annual general meeting of the Municipal Tramways Association will be held, as previously announced, on Wednesday Thursdays and Friday, September 17, 18 and 19, in the Albert Hall, Dundee. Mr. T. B. Goodyer, general manager of the Croydon Corporation Tramways, will preside. The programme is as follows;

WEDNESDAY, SEPTEMBER 17.

10 a.m. Meeting of the Executive Council in the Albert Institute.

10-30 a.m. Reception by the Lord Provost (Sir William Don, K.B.E.), Magistrates, Convener and Members of the Dundee Tramways Committee in the Albert Gallery.

11 a.m. Conference
Presidential Address by Mr. T. B. Goodyer, general manager of the Croydon Corporation Tramways.
A Short History of the City of Dundee, by Mr. Peter Fisher, general manager, Dundee Tramways Undertaking.
Paper: "Where Do We Stand," by Councillor Kelly, convened of Glasgow Corporation Tramways Committee.
Discussion on the foregoing paper to be opened by Councillor W. J. Squires, J.P., chairman, London County Council Highways Committee.

1 p.m. Light Lunch in the Albert Hall, at the invitation of the Lord Provost, Magistrates and Town Council of Dundee.

2-30 p.m. Resumption of Conference.

5 p.m. Adjournment of Conference.

7 p.m. Dinner in the Albert Hall at the invitation of the Lord Provost, Magistrates and Town Council of Dundee.

THURSDAY, SEPTEMBER 18.

10 a.m. Meeting of the Executive Committee in the Albert Institute.

10-15 a.m. Meeting of the Managers' Section.

10-30 a.m. Conference Resumed:
Paper: "Motor Omnibus Services," by Mr. A. R. Fearnley, general manager of Sheffield Corporation Tramways.
Discussion on the foregoing paper to be opened by Alderman E. Russell-Taylor, J.P., chairman of Liverpool Corporation Tramways Committee.

1 p.m. The Association's Luncheon (in place of the Annual Dinner) in the Albert Hall (for members and friends).

3 p.m. Annual Business Meeting of the Association in the Albert Institute.

FRIDAY, SEPTEMBER 19.

Morning Excursion: River trip to Kinfauns, passing under the Tay Bridge. Leave Dundee at 10 a.m.
Light luncheon will be provided on board by the Lord Provost, Magistrates and Town Council of Dundee.

A special programme has been arranged for ladies attending the Conference.

TRAMWAY WORKERS' DEMANDS.

DISAGREEMENT AS TO ARBITRATION METHODS.

On Friday, September 5, in accordance with the terms of settlement reported in last week's issue, Sir Robert Horne, Minister of Labour, met representatives of the Municipal Tramways Association, the Tramways and Light Railways Association, and the Transport Workers' Federation at the offices of the Ministry of Labour. After discussion of the terms of reference in which the Transport Workers' Federation's claims should be submitted to arbitration, it was agreed that the Minister of Labour should submit the whole claim to the Interim Court of Arbitration under the Wages (Temporary Regulation) Act, the terms of reference to include a schedule of the undertakings which are affected by the claim.

The method of arranging for arbitration was the subject of serious disagreement between the parties. Representatives of the tramway owners naturally expected that arbitration proceedings would be taken in accordance with the Act, and that the Court should hear the case in districts. But the delegates of the Transport Federation argued that, as the claims put forward applied to the whole nation, the question must be dealt with on a national basis, and urged the precedent of the national agreement of March 20.

By way of compromise it was arranged that the case should be referred to the Court and that the Court should be asked to grant a preliminary hearing to the parties at 10.30 a.m. on Monday, September 15, when the parties would put forward their respective contentions as to the procedure to be adopted. At the preliminary hearing the Arbitration Court will be asked to make early arrangements for the further proceedings.

SHEFFIELD TRAMWAYMEN'S STRIKE.

ARBITRATION FLOUTED.

It is evident that the Transport Workers' Federation has no hold over the tramway workers of Sheffield. Despite the fact that a Court of Arbitration is to hear the spokesmen of the Transport Workers' Federation as representing the whole tramway employees, with a view to arriving at a judgment upon the claims put forward by the men, the Sheffield tramway workers have put forward claims of their own, and have struck to enforce them. The strike,

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which was begun on Thursday morning, came as a surprise. It was understood that, though the men had handed in strike notices a week ago, action would be suspended until the results of the national arbitration had been made known. On Wednesday night, however, at 12 o'clock, a meeting was held, which lasted till 4 on Thursday morning, the final decision being to put the strike notices into force at once.

Sheffield tramway workers have already earned a reputation for what may be mildly described as forcible tactics. Their demands are higher than those put forward by the Transport Workers' Federation. They claim 2s. per hour regular pay, and time and half pay for Sunday duty, the latter claim to be granted at once. If these demands were granted, Sheffield Tramway Department would be saddled with an additional burden of £200,000 a year. In the circumstances the Sheffield Corporation Tramways Committee are amply justified in giving a point-blank refusal, and it is reported that they are being supported by local public opinion.

MISCELLANEOUS NEWS AND NOTES.

York Omnibus Fares.—York Tramways Committee have recommended that the 1d. fare on the omnibuses be increased to 1½d.

Liverpool Corporation have ordered 5,500 tons of Sandberg silicon-sorbitic steel tramway rails from Walter Scott, Ltd., of Leeds.

Conductor Gets 1s. Reward.—A conductor on Manchester Corporation Tramways found a bag containing over £50 in silver, and on returning it to the owner was rewarded with a shilling.

Another Edinburgh to Queensferry Scheme.—Edinburgh Tramways Committee have deferred consideration of a proposal to construct a tramway to Queensferry by way of Kirkliston. It will be remembered that two or three years ago a scheme for a tramway to the same place by a more direct route was dropped.

Certificates for Women Employees.—Maidstone Light Railways Committee have decided to present the women employees who are leaving the service with certificates. The tramway employees entertained the women employees at a supper on September 10, when the tramway service was stopped at 8.30 p.m.

Sandberg "In Situ" Treatment of Rails.—Messrs. Scholey and Company, of 56, Victoria Street, London, S.W.1, the licensees and contractors for this patent for increasing the durability of tramway rails "in situ," have received an order for treatment of track from the Newcastle Corporation.

Women Conductors v. Demobilised Soldiers.—Maidstone Corporation have informed the local branch of the Demobilised Sailors' and Soldiers' Association that they cannot comply with the demand that tramway conductresses should be dismissed, and their places filled by discharged soldiers at a minimum wage of 50s. a week. Compliance would increase working costs, and involve higher fares.

Cable-Makers' Council.—The Joint Industrial Council for the Electric Cable-Making Industry held its first meeting on September 4th at the offices of the Ministry of Labour. Mr. L. B. Atkinson was elected chairman, and Mr. A. Allison vice-chairman, while Mr. H. Standring and Mr. H. McCale were appointed secretaries, the former for the employers' side and the latter for the employees'.

Southend Corporation Light Railways Committee have considered the specifications received from the Brush Electrical Engineering Co., Ltd., for the supply of six large double-deck, top-covered cars and one "toast rack" car, with Brush electrical equipment, at prices amounting of £17,886, and resolved that these be approved and the company be instructed forthwith to proceed with the construction of the cars.

The Institution of Automobile Engineers.—The first meeting of the session of the Institution of Automobile Engineers will be held on Wednesday, October 1st, at the Royal Society of Arts, John Street, Adelphi, W.C., at 8 p.m., when Mr. Thos. Clarkson, M.Inst.C.E., will deliver his presidential address. Mr. Clarkson will also deliver his address to the Midland Centre on the following night, at the White Horse Hotel, Congreve Street, Birmingham, at 7.30, p.m.

Claims of Belfast Car Builders.—At a recent meeting of Belfast Town Council, a deputation representing local trades unions interested in tramcar building was received. It was pointed out that the repair work to be done was absorbing all the available labour and material in the city, and that the tramcars were needed immediately. The Council agreed, however, that cars would be built in Belfast as soon as the arrears in repairs had been dealt with.

Proposed Cheaper Tickets at Wallasey.—As reported in a recent issue, Wallasey Corporation Tramways Committee have instituted a system of issuing books of tickets, whereby thirteen penny tickets are sold for a shilling, and thirteen three-halfpenny tickets are sold for 1s. 6d. When the minutes of the Tramways Committee came before the Town Council, it was proposed that the books of tickets should be sold at a reduction of 2d. on the shilling, but the proposal was negatived on a division.

Belgian Railway Electrification.—Within the last few days members of the Commission on the electrification of the Belgian State Railways visited this country and made a tour of inspection of some English electric railways. They were specially interested in the electrified lines of the London and South Western Railway, where some of the conditions are similar to those on the Brussels to Antwerp railway, which it is expected will be the first to be electrified. Both on that Belgian line and on the suburban routes of the London and South Western Railway the average distance between stations is about a mile and a half. The powerful motors used by the London and South Western Company enable a maximum speed of about 55 miles an hour to be reached during part of the run between stations.

Tramwaymen Compared with Brewery Labourers.—In agreeing to support the demands of the Transport Workers' Federation, Burton-on-Trent tramwaymen point to the fact that brewery labourers in the town obtain wages up to 56s. 6d., which are higher than the wages now paid to conductors.

The Kearney Railway.—At the Housing Exhibition Committee of the Glasgow Corporation, it was reported that the patentees of the Kearney high-speed railway are prepared to exhibit a working model of the railway, but that they would not undertake the necessary expense of transit and fitting up. After consideration, the committee agreed to grant space for the exhibit free of charge, and to contribute a sum not exceeding £100 towards the expense of placing the exhibit in the exhibition, and remitted to the chairman to make the necessary arrangements.

Increased Fares at Walsall—A Correction.—In last week's issue, it was stated under the above heading that the fares on Walsall Corporation Tramways had been increased by 50 per cent., and that the stages had been shortened. With friendly courtesy, Mr. R. L. Horsfield, general manager of Walsall Corporation Tramways, corrects the error in a letter, in which he points out that there has been no shortening of stages and that the only increases are ½d. on each class of ticket on the tramways and 1d. on the motor service tickets, excepting the 1d. fare, which has been increased by ½d.

The Technical Review. — The Technical Supplement of the "Review of the Foreign Press," formerly issued by the general staff of the War Office, will in future be conducted as the "Technical Review," at 20, Tavistock Street, London, W.C.1, to which address all communications should be forwarded. Under its original editor and the same organising and technical staff, the "Review" will continue to form on an even broader basis a valuable and important work in reviewing and digesting the technical press of the world. At present the "Review" is issued in the same way as the Supplement, price 1s.

Tramway Goods Service at Bradford.—Bradford Corporation are considering the carriage of goods on the tramways, and are ascertaining what can be done in the direction of extending the carrying powers already granted to various tramway authorities. The idea is to use wagons equipped with electric motors taking power from the overhead tramway lines. The wagons would also be fitted with storage batteries, thus enabling them to leave the tramway route and deliver goods within a certain radius of the tramway lines. About five years ago Mr. C. J. Spencer, then general manager of the Bradford Corporation tramways, first put in service wagons of this kind, and their use has been found advantageous.

Fatal Turn on the Tramway Track.—The story of how an old man met his death by stepping in front of a tramcar was vividly told at the inquest held on the body of William Griffiths, at Blackpool. The man was walking along the island footway, and the driver of the tramcar sounded his gong. Instead of remaining where he was or going further into safety, the man turned and stepped directly in front of the car. The brakes and lifeguard acted promptly, but the injuries he received in being knocked down killed the man. The Coroner, in exonerating the driver from blame added that the Corporation were entitled to credit for making a separate tramway track, which was an excellent arrangement for securing safety to the public.

Lanarkshire Tramways.—In reference to the proposed purchase by the county and burgh authorities of the undertaking of the Lanarkshire Tramways Company, the secretary of the company has informed the authorities that the expenditure on the company's undertaking (excluding the County Council's lines) has amounted to approximately £460,900. To construct and equip a similar undertaking to-day would involve an expenditure of at least £1,000,000 The average rate of dividend paid has been 6.2 per cent. since the company began operations, and 7 per cent. for the period from January 1, 1914, to date. Subject to the approval of the shareholders, the company is prepared to dispose of the undertaking to the County Council on behalf of the purchasers for £463,050; and the compensation of the directors and officials for the loss of offices either by a payment of £12,000 or on the lines of the Belfast Tramways Act—the transfer to be made on December 31 next.

Aluminium for Automobiles.—"The perfection of automobile design involves increasing employment of aluminium. This fact is noticeable in both engines and body work. The light weight of the metal, its ease in casting, ductility, freedom from rust, economy in painting, and the facility with which it is kept bright, all contribute to its popularity." In these well-chosen words the British Aluminium Company commend to the notice of manufacturers and the public a finely illustrated catalogue of aluminium sheet and sections in automobile and aircraft construction. The silver grey metal is not only replacing brass and bronze to some extent in the construction of chassis, but it is superseding wood in body construction. In order to meet the existing demand for sheet and sections, further extensions to the company's factories have been made. The present pamphlet gives, among other things, a description of the application of sheet aluminium in the construction of motor car bodies. Everyone interested in aluminium for any purpose will treasure two tables, one giving the comparative weight in pounds per square foot, of sheets of different thicknesses of aluminium, brass, copper, and steel, and the other setting out the physical and mechanical properties of brass, steel, and aluminium.

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PERSONAL

Capt. Henry Kernick, Cardiff, has left for Singapore to take up the post of manager of the Singapore Electric Tramways Co.

Wolverhampton Town Council has voted an honorarium of three hundred guineas to **Mr. S. T. Allen,** borough electrical engineer, and increased his salary by £200.

Professor Dobson, D.S.O., general manager of the gas, electrical supply and tramways department of the Johannesburg Municipality, has resigned because, it is alleged, the remuneration for the work was quite inadequate.

Mr. R. McFedris, assistant engineer at the Ayr Corporation tramway depot, has been presented by the employees of the department with a marble timepiece on the occasion of his marriage. Mr. William Grant, the manager, made the presentation on behalf of the subscribers.

Mr. Wm. Billington, general manager of the Wigan Corporation tramways, has resigned. The Corporation Tramways Committee proposes to allow him six months' salary in lieu of notice, and express the hope that his health, which has been the cause of his resignation, will be improved.

Mr. J. Beckett, formerly borough treasurer of Accrington, has commenced his duties as secretary of the Municipal Tramways Association. The Corporation officials of Accrington, in recognition of his services, have presented him with an English gold lever watch and gold albert. At the presentation the Town Clerk, the Borough Engineer, and the Chief Constable spoke in appreciation of Mr. Beckett's services to the borough, the Chief Constable making the presentation.

FINANCIAL.

Madras Electric Tramways.—The directors have declared interim dividends on the preference shares of 6 per cent. per annum, less tax, and on the ordinary shares of 8 per cent. per annum, free of tax.

Walsall Corporation Buses.—The 1918-19 accounts of the Walsall Corporation buses show an income of £28,000, which gives an average of 18.981d. per bus mile, compared with 17.979d. the year before. The expenditure was £21,748, and represented 14.927 per mile, as against 12.915d. A sum of £6,278 was carried to net revenue account.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended September 10th amounted to £81,974, an increase of £14,269 as compared with the corresponding period last year. The route mileage was 141.67, the same as a year ago. From April 1st (the commencement of the financial year) to September 10th (twenty-three weeks and two days) the total receipts were £1,803,062, an increase of £381,503 in the corresponding period of 1918.

West Hartlepool Tramways Surplus.—At the recent meeting of West Hartlepool Town Council, Alderman Martin, chairman of the Tramways Committee, mentioned that after meeting all working expenses, the tramways accounts for last year showed a surplus of £11,999, or 14.52 per cent. on the capital expended. After paying interest, etc., £8,649 was carried to reserve, and the latter sum now stood at £21,344. The number of passengers carried was 7,694,204, an increase of 1,500,000 during the year.

Southport Corporation Tramways.—The annual report of the general manager, Mr. T. J. Kendrew, for the year ended March 31, 1919, shows that the total revenue was £53,491 (an increase of £20,917), and the working expenses, including war allowances, £33,143 (an increase of £14,720), leaving a gross profit of £20,348 (£10,085). After providing for sinking fund contributions, interest and income tax, £1,053 has been appropriated to renewals fund and £2,100 to the aid of rates, while £504 has been applied to the reduction of previous deficits. Factors in obtaining large increases in income include the taking over of the Southport Company lines, the increase in fares and receipts from Sunday running. The average receipts per car mile were 17.735d. (an increase of 5.740d.) and the average expenses 10.938d. (an increase of 3.374d.). During the past year there have been large increases in wages and a reduction in working hours from 57 to 48 hours per week. The undertaking now has 23 miles of track and 46 cars. This is the first year in which any contribution has been made to the rates, and the general manager remarks that considering the present high price of material and cost of labour it is questionable whether it is wise to continue this policy in the future. The charge for electrical energy has been increased from 1½d. to 2¼d. per mile, less 5 per cent. To improve the condition of the rolling stock 18 trucks, 24 motors and 3 toast-rack car bodies have been ordered.

CONTRACTS AND ORDERS.

Bolton Tramways Committee have accepted a tender by the English Electric Co. for eight bogie-car electric equipments and four spare motors.

Heston and Isleworth Urban Council have accepted the tender of the General Electric Company for the supply of a 500 k.w. rotary converter and transformer and cable work at £7,925.

Bradford City Council have accepted the following tenders:—Babcock and Wilcox, Ltd., three water-tube boilers with superheaters, stokers, etc.; Peter Brotherhood, Ltd., one cooling tower and chimney for existing cooling stack.

Increased Prices.—In consequence of the increase of prices during the war, Newcastle Town Council have agreed that a memorandum should be endorsed on a contract dated February 27th, 1915, with Walter Scott, Ltd., for the supply of rails and fishplates, substituting for the original price of £9,362 the sum of £21,488.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	Sept. 2	512	551	+ 39	22	12,118	+ 674
Aberdeen Corporation	,, 3	2,773	3,652	+ 879	13½	48,527	+ 10,638
Ayr Corporation	,, 6	656	723	+ 67	16	15,037	+ 2,686
Belfast City	,, 5	8,660	10,657	+ 1,997	23	237,166	+ 56,511
Birkenhead Corporation	,, 7	2,836	3,195	+ 359	22½	65,363	+ 14,265
Birmingham Corporation	Aug. 30	53,172	25,566	+ 2,394	22	561,626	+ 50,026
do. Motor Buses	,, 30	1,406	1,656	+ 250	22	38,826	+ 4,009
Blackburn Corporation	Sept. 3	1,672	2,340	+ 667	23½	55,489	+ 11,963
Bradford Corporation	,, 6	4,613	11,404	+ 1,485	23	263,696	+ 51,226
Burnley Corporation	,, 6	2,361	3,096	+ 737	..	..	..
Burton-on-Trent Cor.	Aug. 31	426	545	+ 119	22	11,023	+ 1,873
Bury Corporation	Sept. 7	2,263	2,506	+ 243	22½	56,172	+ 7,423
Chatham & District	Aug. 28	1,527	1,768	+ 241	24	52,027	+ 7,144
Cork Electric	,, 28	661	878	+ 217	24	22,874	+ 1,095
Derby Corporation	Sept. 6	1,549	2,165	+ 616	23	44,700	+ 9,466
Dundee City	,, 3	2,966	3,677	+ 611	15½	41,375	+ 9,907
East Ham Corporation	,, 6	1,679	1,928	+ 249	22½	43,943	+ 8,744
Edinburgh	Aug. 30	9,036	10,708	+ 1,670	8½	107,398	+ 20,885
Glasgow Corporation	Sept. 6	29,971	33,560	+ 3,589	14	447,633	+ 46,242
Glossop (U.E. Sup. Co.)	,, 6	167	208	+ 41	26	7,974	+ 1,885
Huddersfield Corporation	,, 6	4,450	4,880	+ 430	23	112,646	+ 24,106
Ilford U.D. Council	,, 6	1,075	1,278	+ 203	22½	28,078	+ 4,821
Ipswich Corporation	,, 6	867	1,169	+ 282	23	22,315	+ 3,696
Isle of Thanet	,, 3	688	2,361	+ 1,473	18½	42,585	+ 28,159
Kilmarnock Corporation	,, 6	271	288	+ 17	16½	4,777	+ 604
Lanarkshire	Aug. 28	3,856	4,150	+ 294	24	121,902	— 741
Leeds City	Sept. 6	14,681	16,738	+ 2,057	23	386,149	+ 88,696
Leicester Corporation	,, 6	4,708	6,084	+ 1,376	..	..	..
Leyton U.D Council	,, 4	2,498	2,104	+ 606	23	72,990	+ 20,376
Liverpool Corporation	,, 6	19,042	23,951	+ 4,909	25½	774,147	+ 182,764
London County Council	,, 10	67,705	81,974	+ 14,269	23½	1,803,062	+ 381,503
Maidstone Corporation	,, 4	320	434	+ 114	22½	9,005	+ 2,348
Manchester Corporation	,, 6	26,954	31,263	+ 4,309	23	701,951	+ 115,755
Newcastle-on-Tyne Cor.	Aug. 30	9,278	9,240	— 38	22	210,115	+ 16,524
Northampton Cor.	Sept. 5	790	1,332	+ 542	22	29,771	+ 9,673
Nottingham Corporation	,, 4	5,647	7,303	+ 1,656	23	153,246	+ 29,710
Oldham Corporation	,, 7	3,511	4,549	+ 1,038	24	106,747	+ 21,895
Reading Corporation	,, 4	1,432	1,699	+ 267	22½	26,851	+ 6,574
Rotherham Corporation	,, 3	2,584	2,031	— 553	22½	48,930	— 2,355
Sheffield Corporation	,, 7	13,228	17,044	+ 3,816	23½	463,520	+ 83,581
Southampton Cor.	,, 3	2,787	2,790	+ 3	22½	62,987	+ 4,115
Southend-on-Sea Cor.	,, 3	2,370	3,796	+ 1,426	23	56,291	+ 23,170
South Shields Cor.	,, 2	1,282	1,497	+ 214	18	24,834	+ 4,315
Sunderland Corporation	,, 7	2,118	3,018	+ 900	23	68,370	+ 19,868
Torquay Tramways	Aug. 14	1,700	2,019	+ 319	32	34,385	+ 6,037
Tyneside Trys. & Trmrds.	,, 27	1,167	1,273	+ 105	9	10[illegible]	+ 278
Wallasey Corporation	Sept. 6	2,040	2,689	+ 649	22½	61 670	+ 15,615
Walsall Corporation	,, 6	1,215	1,641	+ 426	23	32,411	+ 3,915
Walthamstow U.D. Coun.	,, 6	1,560	1,806	+ 246	23	41,277	+ 6,994
Warrington Corporation	,, 4	792	917	+ 125	22	19,517	+ 3,074
West Ham Corporation	,, 4	4,815	5,287	+ 473	22½	122,703	+ 20,329
Wolverhampton	,, 10	1,644	2,068	+ 424	23	47,405	+ 6,686

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Wks.	Aggregate. 1918-19	Increase or Dec.
Anglo-Argentine	Sept. 2	£53,819	£60,861	35	£1,968,640	+ £30,751
Ballarat and Bendigo (4 wks)	July 20	2,948	2,981	16	13,799	+ 324
Brazilian Traction (Mlrs.)	July	9,465,000	10,070,000	30	64,033,000	+ 4,875,000
Brisbane	Aug.	42,670	42,245	22	304,400	+ 13,946
British Columbia $	July	413,968	642,090	4	642,090	+ 228,122
Buenos Aires Lacroze	Aug.	41,817	46,843	8	92,068	+ 6,106
Burmah Tram. & Light Rs.	July 31	34,848	44,045	52	450,448	+ 115,662
Calcutta Rs.	Sept. 6	83,044	90,582	35½	..	+ 394,030
Carthagena and Herrerias	Aug.	2,729	2,991	34	23,965	— 11,887
Cordoba	Feb.	12,972	13,549	48	159,208	+ 11,492
East India	Aug.	1,975	2,761	4	2,761	+ 786
Hong Kong $	July 12	15,662	15,738	28	404,631	+ 26,370
Kalgoorlie	April	2,876	2,807	18	10,400	— 71
La Plata	July	6,721	5,317	31	32,774	+ 2,840
Lima	June	42,161	47,811	26	282,907	+ 26,682
Lisbon Escu	Mar.	288,299	276,625	..	..	..
Madras Rs.	Aug. 15	42,117	46,278	32	598,767	— 11,136
Manila $	June	183,250	160,670	26	1,207,412	+ 170,313
Montevideo	July	31,684	34,159	39	334,076	+ 33,551
Para	July	24,398	24,659	34	196,730	+ 2,502
Pernambuco	Sept. 7	4,547	5,640	35½	182,049	+ 22,356
Peruvian $	July	987,300	1,058,780	..	..	..
Rangoon	Aug.	5,760	6,472	34	51,660	+ 2,147
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore $	July 26	14,631	14,595	30	458,631	+ 50,458
Toronto $	July	1,049,936	977,262	30	7,110,558	— 295,547
Winnipeg $	July	288,155	337,978	30	2,212,618	+ 113,128

CARS, MOTORS, CONTROLLERS.

(DICK, KERR SYSTEM.)

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THE
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SATURDAY, SEPTEMBER 20, 1919.

POLICY AND PRINCIPLE.

Observers of disputes between municipal tramway authorities and tramway employees have had good cause to forecast victory for the latter even before the case has been stated. A number of reasons may be given in explanation of the almost uniform success of the tramway workers in prosecuting their claims to higher wages, shorter hours, and better conditions of labour all round. One strong reason is that tramway workers were, as a class, underpaid before the war. The community discovered a fund of cheap labour, and exploited it for the purpose of obtaining cheap travel. Realising that they have used their fellow-citizens unfairly, large numbers of people are in a conscience-stricken panic on the subject. Another cause, but of an opposite kind, is the unity of the tramway workers and the singleness of their aim opposed to authorities acting singly, isolated, divided in counsel, and having no definite policy. By successive victory and fortified by assurance of public sympathy, tramway workers have been induced to put a very high value upon their labour. In fact, up till the present moment, the limits of the value of tramway labour are undefined, and concessions to their claims would seem to be bounded neither by law nor reason. The latest tribute to the power of tramway labour has been paid by the Ministry of Labour. In the nation-wide dispute between the tramway owners and workers at present going on, the parties agreed to resort to arbitration under the Wages (Temporary Regulation) Act, 1918, recently extended to 1919. In this Act it is explicitly provided that arbitration shall be taken district by district. But the representatives of the Transport Workers' Federation have demanded, in spite of the law, that the arbitration shall be national. The Minister of Labour, taking advantage of the powers vested in the Interim Court, has conceded the demand, with the proviso that evidence shall be taken in districts. The concession is politic, and it may in the end work out to a fair adjustment, but the thoughtful mass of the nation is beginning to be wearied of the continual policy of concession which seems to have no basis in principle. Evidence of this feeling has been shown in regard to the recent strike of Sheffield tramway workers. The strike was wanton and unauthorised by the men's union, but it was formidable enough, backed, as it was, by the support of the tramway workers in neighbouring districts, and had the Sheffield Corporation Tramways Committee lacked courage and principle, the strikers would have gained another victory. Happily the Sheffield Committee withstood the tramway men, and the result of their action must have surprised even themselves. Not only local opinion but public opinion all over the country has strongly approved. Sir William Clegg and his colleagues took up the strong ground that they are trustees of the community, and that they are in duty bound to protect the undertaking, which is the property of the ratepayers, from demands that would involve it in bankruptcy. As trustees, also, the Sheffield Tramways Committee regard it as their duty to protect the poor and the lower-paid workers against the hardships which higher tramway fares—inevitable if the demands of the tramway workers were granted—would undoubtedly impose upon them. Here is a principle upon which tramway authorities may base a straightforward policy and give a lead to the Government.

MUNICIPAL TRAMWAYS ASSOCIATION.

ANNUAL CONFERENCE AT DUNDEE.

By holding the Annual Conference this year at Dundee the Municipal Tramways Association have departed from previous practice. As explained in our issue of August 14th, however, it was arranged when Mr. Peter Fisher, general manager of Dundee Corporation Tramways Department, was president, in 1917, that a purely business meeting should be held in London that year, and that as soon after the war as possible the Association would hold the Annual Conference in Dundee. Happily, it has been possible to carry out the agreement this year, and a most successful series of meetings was held on Wednesday, Thursday, and Friday of this week. Thanks largely to the hospitable efforts of Dundee Corporation as a whole, and the Tramways Committee in particular, as well as the high organising ability of the newly-appointed General Secretary of the Association, Mr. J. Beckett, the arrangements were so complete as to enable the Conference to carry through its long programme without a hitch.

At ten o'clock on Wednesday morning the Executive Council met in the Albert Institute, and shortly thereafter the Association members were welcomed to Dundee by the Lord Provost, Sir William Don, the magistrates of the city, and the Convener and members of Dundee Tramways Committee, in the Albert Gallery.

Adjourning to the Victoria Institute, the Conference was opened by the President, Mr. T. B. Goodyer, general manager of the Croydon Corporation Tramways, who took for the subject of his address a general survey of the present situation of the tramway industry.

Mr. Goodyer expressed his thanks to the Dundee Corporation for their kindly reception of the Association Conference, and proceeded to deal with those matters vitally important to the industry in which they were all so deeply interested. First, the President took up the application of the National Transport Workers' Federation for reduced working hours and variations in conditions of labour, and gave credit to the tramway representatives who had arrived at an agreement which has fixed conditions of service applicable to the whole of the undertakings in the country. Though it was obvious that the revised conditions of operating staffs would entail considerable increase in working costs, they would have the right to expect increased efficiency on the part of the workers in return. All tramway systems, he said, are a convenience to the residents of the districts through which they run, and the owners, be they ratepayers or shareholders, are entitled to their share of the benefits, and those using the cars should be willing to pay such fares as will give a reasonable return upon the capital invested.

Continuing, Mr. Goodyer quoted the view of Mr. John Young, expressed in his presidential address at Glasgow, in 1902, that there is one common essential to the success of tramway undertakings, and that is they must be managed on pure business principles.

The President next referred to the formation of the Joint Industrial Council for the Tramway Industry, which had entailed an enormous amount of labour upon the Executive Council, and it was a matter of considerable satisfaction to him when they met in London on Friday, 5th inst., to have the constitution endorsed.

Another important innovation in connection with the tramway industry in this country was, Mr. Goodyer said, the Ministry of Transport Bill. They were apprehensive in the first instance that municipal tramway undertakings would be seriously interfered with by this measure, but the Ministry had shown no intention of taking over the working of the tramways. Although the Board of

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Trade had done good work in the past, he looked forward with some degree of hope that their necessities in the future would be better looked after under the new administration.

Mr. Goodyer next referred to the report of the Select Committee on Transport (Metropolitan area) and its recommendation for a supreme traffic board for Greater London possessing executive powers to control, co-ordinate, and initiate, and to safeguard and further public interests in respect of transport. This Select Committee condemned the inequitable rating of tramways and their contribution towards the maintenance of the surface of roads as compared with the immunity of omnibuses from both these charges. In this connection the speaker referred to the special report of the local legislative committee of last session, referring to the anomaly of the compulsion upon municipalities to contribute to the upkeep and cost of reconstruction of roads and the immunity of private enterprise therefrom. These subjects were ripe for re-consideration.

Mr. Goodyer quoted an extract from the report of the Select Committee on Motor Traffic, which endorses the opinion that the duty of organising and accommodating traffic schemes and regulations is a municipal duty.

The President referred to the fact that owing to the ever-increasing work entailed upon the honorary secretary it had been deemed desirable to appoint a paid officer for that work, and he had much pleasure in welcoming the new general secretary, Mr. J. Beckett, to the conference of the Association.

Mr. Peter Fisher, general manager of Dundee City tramways, read a short and highly interesting history of the City of Dundee, which gave great pleasure to the conference.

Councillor Kelly, convener of the Glasgow Corporation Tramways Committee, read a paper on "Where do we stand." Mr. Kelly said that he had merely put together a few notes on the following subjects:—(1) Where do we stand politically; (2) Where do we stand mechanically; (3) Where do we stand electrically; (4) Where do we stand economically; and (5) Where do we stand traffically? On each of these points Councillor Kelly made interesting and suggestive remarks. The discussion on Councillor Kelly's paper was opened by Councillor W. J. Squires, J.P., chairman of the London County Council Highways Committee.

On Thursday, at 10.15 a.m., the Managers' Section held a meeting, at which it was decided to resume in the spring of next year the annual conference of managers, which has been suspended since the outbreak of war. It is hoped that time will be found for the consideration of numerous technical problems that urgently demand attention, including particularly standardisation. The Executive will later arrange a date for the meeting and other details.

The Conference resumed its session at 10.30 a.m., in the Victoria Art Gallery, Mr. T. B. Goodyer again presiding, when a paper was read by Mr. A. R. Fearnley, general manager of the Sheffield Corporation tramways, on "Motor Omnibus Services." After defining the scope of his subject, Mr. Fearnley proceeded to look at the question from the point of view of a municipality engaged in transport work and to show as a result of the experience gained whilst working a motor omnibus service as an auxiliary to a large tramway system during the last seven years, how and to what extent motor omnibuses can be made use of. The author adduced particulars of the experience of Sheffield Corporation, and quoted important clauses in the Powers Bill which showed that Sheffield Corporation had made ample provision for being able to carry on the business of motor omnibus traffic. Most notably Sheffield Corporation claimed absolute freedom to charge such fares as they might think fit from omnibus passengers. Mr. Fearnley gave statistics illustrating the method Sheffield Corporation employed in carrying out the motor omnibus business and the results obtained. The motor omnibus so far as it has been developed, said Mr. Fearnley, is (1) an excellent vehicle for acting as a feeder and in connecting up tramway routes and services; (2) an unusable vehicle for satisfactorily dealing with heavy town traffic; (3) quite inadequate for dealing with peak loads; (4) financially impossible for workmen's traffic at reduced fares, and (5) in regard to average speed maintained throughout the day has no advantage over the electric tramcar. Mr. Fearnley instituted comparisons between tramcar and motor omnibus services, giving average expenses per mile run, average expenses per passenger carried, and average expenses per seat provided. The motor omnibus, Mr. Fearnley concluded, is not going to supersede electric tramcars, but it can serve a most useful purpose (1) for connecting up tramway routes for cross town traffic which cannot be served by tramcars; (2) for relieving congested tramway routes by diverting part of the traffic along other routes; (3) for connecting up villages and rural districts with tramways and railways and thereby providing such districts with regular and direct transport facilities which they have hitherto badly lacked. In conclusion, Mr. Fearnley referred to the TRAMWAY AND RAILWAY WORLD and quoted with approval the opinions which have frequently been expressed in this journal during several years past, that there is no necessity for competition between tramcars and omnibuses, but that both are required.

The discussion on Mr. Fearnley's paper was opened by Alderman E. Russell-Taylor, J.P., chairman of Liverpool Corporation Tramways Committee, who criticised the author's general conclusions. He went further than Mr. Fearnley in his advocacy of motor omnibuses, and envisaged marked improvements in them. More powerful motors would give higher speeds and place the vehicles in a more advantageous position as compared with tramways. He aroused some surprise by the assertion that motor omnibus bodies had as long a life as car bodies.

Mr. H. Webber, general manager of Keighley Corporation Tramways, advocated the claims of railless trolley cars.

Mr. J. B. Hamilton, general manager of Leeds Corporation Tramways, expressed his gratification that the figures given by Mr. Fearnley, showing the high costs of omnibus running, confirmed those he had himself put forward in a paper read at the Conference of 1913. He drew attention to the great possibilities of improvement in tramway construction and operation, and indicated that his belief was as strong as ever it was that electric traction remained unrivalled as a propelling agent.

Mr. J. Dalrymple, general manager of Glasgow Corporation Tramways, said that many authorities were contemplating extensions, and would like to know when to use omnibuses and when it was more advisable to construct tramway lines.

Mr. W. Murray, manager of Walthamstow tramways, made the useful proposal that at hours of peak load, if a tramway was overloaded, a service of omnibuses should be superimposed on the tramway service, the omnibuses carrying long-distance passengers, with non-stop runs, possibly at enhanced fares.

Alderman Sir John Courtis, chairman of Cardiff Corporation Tramways Committee, expressed his firm belief in tramways where large numbers of passengers had to be carried.

Mr. Alfred Baker, general manager of Birmingham Corporation Tramways, speaking from experience with a fleet of 60 omnibuses, gave his opinion that the omnibuses were improving in reliability, lost mileage was diminishing, but he saw no reason to despair of tramways yet. He had an open mind, and desired to make use of any vehicle that gave the best results and met the requirements of the public.

Mr. R. H. Wilkinson, general manager, Bradford Corporation Tramways, dealt at some length with the results of railless traction at Bradford. He believed that, with improvements, it would become a serious competitor of tramways.

Mr. J. M. McElroy, general manager of Manchester Corporation Tramways, analysed the success of the omnibus in London, where tramways had not a fair field, while yet the latter was the medium by which the great tide of traffic was brought into London in the morning and out of it in the evening. It would be a physical impossibility for omnibuses to cope with that traffic.

Mr. W. J. Squires, chairman of London County Council Highways Committee, saw ample scope for both tramcar and omnibus, and emphasised the difficulties they met with in competing against omnibuses.

Other speakers included Councillor Jackson, of Liverpool; Mr. Turner, chairman of Belfast Tramways Committee; and Mr. Eardley, manager of Stockport Corporation Tramways.

Mr. A. R. Fearnley concluded the discussion with a very effective reply to criticisms of his paper.

The Association luncheon took place in the Art Galley at 1 o'clock, and the afternoon was devoted to the annual business meeting, at which the annual report of the Executive Council was considered. The report referred to the constitution of the secretaryship into a permanent office, and the establishment of central premises in London. The alteration of the Articles of Association, Standardisation of Overhead Line Material, Wear and Tear Allowances for Income Tax Purposes; the Demobilisation of Tramway Employees; the Standardisation of Gear Wheels; Pinions and Axles; the Report on Rail Corrugation; the Agreement between the Association and the National Transport Workers' Federation; the Joint Industrial Council; the Ministry of Transport Bill, 1919; the Statutory Undertakings (Temporary Increase of Charges) Act, 1918; Wages Arbitrations and Awards; the Electricity Supply Bill, 1919; and Road Maintenance charged upon Tramway Undertakings, were the principal subjects dealt with in the report.

The membership of the Association now stands at 201.

The following officers were elected:—President, Sir John Courtis, chairman of Cardiff Corporation Tramways Committee; Vice-President, Mr. G. W. Holford, general manager, Salford Corporation Tramways; Solicitors, Mr. E. R. Pickmere, Town Clerk, Liverpool, and Mr. S. F. James, Town Clerk, Ilkeston; Treasurer, Mr. A. R. Fearnley, manager, Sheffield Corporation Tramways; Executive Committee, Councillor W. G. Wylie, chairman of South Shields Corporation Tramways Committee; Councillor C. Higham, vice-chairman of Blackburn Corporation Tramways Committee; Mr. J. Barnard, general manager, Bolton Corporation Tramways; Mr. P. Fisher, general manager, Dundee Corporation Tramways; Mr. J. Dalrymple, general manager, Glasgow Corporation Tramways, and Mr. R. L. Horsfield, general manager, Walsall Corporation Tramways. As Mr. J. Beckett is now permanent secretary, election in his case was not required, but the hearty manner in which he was received augurs well for his success.

On Friday, an excursion to Kinfauns brought to a close a Conference which had all the pre-war characteristics, and admirably strengthened the tradition of success which has been the pleasing feature of the annual gatherings of the Municipal Tramways Association.

Traffic on Westminster Bridge.—Fears are entertained as to the stability of Westminster Bridge, in view of the heavy traffic constantly passing over it. The following heavy vehicles were noted as passing over the bridge at one time: 8 fully loaded double-deck tramcars, 9 motor omnibuses, 1 traction engine and trailer, 11 drays and vans.

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THE NATIONAL TRAMWAY CRISIS

A FIRST STAGE IN ARBITRATION.

Another stage in the struggle between the tramway owners and workers for adjustment of their relative claims was entered on the morning of Monday, September 15th, when representatives of the parties appeared before the Court of Arbitration at Old Palace Yard, and held a preliminary discussion as to the procedure and method of arbitration proceedings.

The employers' representatives had previously arrived at the conclusion that in view of the present financial position of the tramway undertakings no further increase of wages could be granted without raising the fares or increasing local rates to meet deficiencies, and they had also urged that as the circumstances varied in different parts of the country, arbitration should take place not in one centre, but in districts throughout the country. The purpose of the conference was to decide whether the arbitration should be in one centre or whether there should be a series of hearings for various districts.

On the employers' side the following bodies were represented: The Municipal Tramways Association, the Tramways and Light Railways Association, and the London General Omnibus Company. The workers were represented by the Negotiating Committee of the National Transport Workers' Federation and the Secretary, Mr. R. Williams. The Arbitration Committee consisted of Sir William Mackenzie, Colonel Denny, and Mr. Button.

The discussion on procedure lasted over two hours, both parties being heard. No announcement of the decision of the Court was made, but it was arranged that arbitration proceedings will be continued on Tuesday, September 23rd.

It is reported in the press that in a message to Mr. S. Hirst, of Manchester, on the question of arbitration on the wages demand, Mr. R. Williams, secretary of the Transport Workers' Federation, states that the arbitration committee has now decided that, while the arbitration will be national in scope, evidence will be taken in London, Bristol, Manchester, and Glasgow.

FUTURE ORDERS.

Glasgow Corporation have asked the electrical engineer to invite tenders for the supply of six electric vehicles needed for the carting work of the electricity department.—Richmond Town Council are seeking a loan for the purchase of two motor fire engines.—Harwich Town Council have arranged to purchase two electric vehicles.—Bedford Town Council have decided to purchase a motor fire engine at a cost of £1,365.—Hindley Urban District Council are seeking a loan of £800 for the purchase of a motor wagon.—Milton Regis Urban District Council have decided on the purchase of two Foden steam wagons.—Dorking Rural District Council have obtained a loan of £1,500 for the purchase of a steam motor tractor and trailer.—Holmfirth Urban District Council have obtained a loan of £1,177 for the purchase of a steam motor wagon.—Ruthin Rural District Council have obtained sanction to raise a loan of £1,662 for the purchase of a steam tractor engine and trailer.—Southport Town Council have secured permission to get a loan of £1,311 for the purchase of a motor tipping wagon.—The Henham Urban District Council, which recently voted £13,825 for the purchase of two motor lorries, two petrol motor lorries, six electric dust vans, etc., have now obtained sanction to raise a loan for the purpose.—Ilkley Urban District Council have obtained a loan of £1,250 for the purchase of an electric tipping wagon.

RAIL HARDENING AND ARC WELDING

BRITISH ASSOCIATION MEMBERS WITNESS THE PROCESSES.

On the afternoon of the 9th inst., the members of the Engineering Section of the British Association at Bournemouth witnessed two interesting demonstrations. There was a large and distinguished assembly at the Tramways Depot, where the members were received by I. Bulfin, Esq., B.A., A.M.Inst.C.E., the General Manager and Engineer. First, the "Insitu" process for increasing the durability tramway rails was shown. A concise and lucid description of the process and its possibilities was given by the inventor, Mr. C. P. Sandberg, M.Inst.C.E., and it was evident from the subsequent discussion that the practical possibilities of the process were appreciated by the gathering, which included a number of eminent metallurgists. The demonstration which followed consisted of the treatment of a length of rail under ordinary working conditions, after which the rail was fractured, revealing to the naked eye a depth of treatment of about a quarter of an inch. Automatic punch tests indicated that the Brinell hardness number of the rail had been raised from 200 to over 500. The length of time the members devoted to discussing the process, the encouraging expressions of opinion, and the absence of adverse criticism, form a clear indication that the process has received a cachet from the scientific world. The other item Mr. Bulfin had arranged, consisted of an interesting exhibition of the Arc Welding Process. A heavy job in the form of a broken lug on a motor casing was very successfully repaired and an interesting demonstration was given of the use of a new manganese steel electrode designed on entirely original lines. The results obtained were very successful and marked a great step in the welding and depositing of this special steel. The whole of the electrodes, including the special manganese electrode, were supplied by Alloy Welding Processes, Ltd., 149, Leadenhall Street, E.C.

MISCELLANEOUS NEWS AND NOTES.

Collision of Tramcars.—Two London County Council tramcars collided at the junction of Vassall Road and Brixton Road, injuring three women passengers.

Reduced Services in Berlin.—In view of the general shortage of coal, further restrictions have been found necessary at Berlin. Among others brought into force early this month is a regulation prohibiting the running of tramway services after 10.30 p.m.

A New Shelter for Salford Passengers.—Having instituted the queue system to relieve congestion of passenger traffic at Victoria Bridge, the Salford Corporation Tramways Committee propose to erect a shelter for waiting passengers at that point.

Sheffield Extension Scheme.—In advocating the amalgamation of Rawmarsh with Sheffield, at a special meeting of the Rawmarsh and Parkgate Trades Council, Mr. Gibson, deputy town clerk of Sheffield, pointed out that, if the tramway systems of the two authorities were unified, there would be cheaper tramway fares for all.

Halifax Must Increase Fares.—A report to Halifax Corporation Tramways Committee shows that, if the present expenditure is continued and there is no increase in revenue, there will be a deficit on the year's working. Wages alone show an increased expenditure of about £52,000 per annum. The Committee has decided to apply to the Board of Trade for powers to increase tramway fares.

Demands of Belfast Motor Drivers.—Demands have been put forward by motor drivers belonging to the Belfast branch of the Amalgamated Association of Tramway and Vehicle Workers for a minimum weekly wage of £4 for weight drivers and £3 10s. for light drivers. A conference with employers' representatives took place on Monday, September 15, but no decision was arrived at, and the deliberations were adjourned until Thursday.

Increased Fares at Paisley.—In connection with the increases of fares proposed by the Paisley District Tramways Company, the Town Council has agreed that the Council should concede the minimum of a penny for the first mile in the case of ordinary fares, but that they should press for the retention of the children's half-penny fare, the workmen's half fare be insisted on, and that arrangements should be made for the workers' cars being run in the morning from 6.30 to 8 o'clock to suit the new hours of starting, and also that the proposed extra charge on holidays and Sundays be opposed.

York Omnibus Experiment.—In moving the adoption of the minutes of York Town Council Electricity and Tramways Committees, Alderman Meyer said that the increase in petrol prices and other things had prevented any of the omnibuses paying. The petrol omnibus receipts were 11.59d. per bus mile and the expenses were 16.48d., and therefore the Council should bear in mind that, as matters were at present, any increase of omnibus accommodation meant spending money with no prospect of any return for it. Given the traffic, he did not think there was any method of local transit as good and as cheap as the tramway system.

Collapse of Sheffield Tramway Strike.—On Tuesday, September 16, Sheffield Corporation Tramways Committee, after meeting the men's representatives issued a notice, giving the tramway employees of the Corporation twenty-four hours in which to make up their minds to return to duty, and stating that, in case the men decided to remain out, the general manager was instructed to take immediate steps towards engaging a new staff to work the service. Late on the same evening, the strikers held a meeting and passed a resolution deciding to resume work, on condition that all the men were reinstated and that there was no victimisation or punishment of any kind. The service was resumed on Wednesday morning.

Birmingham Light Railway to Quinton.—The Birmingham Corporation have given notice that they have applied to the Board of Trade for a further prolongation of the period authorised for the construction of the Quinton Light Railway under their order of 1912, and for the compulsory purchase of lands. The construction of this line was held up by various causes in particular the war, and the Corporation now ask for permission to exercise all their powers under the order until September 6, 1920. Interested persons may lodge their objections with the Board of Trade up to September 25 next, but it is not expected that there will be opposition to the application.

St. Pancras Accident Inquest.—At the resumed inquest on Saturday, September 13, on the victims of the tramway accident in Pancras Road, London, H. S. May, rolling-stock superintendent of the L.C.C. Tramways Department, said the brakes of the car were in good condition. In his opinion, a driver would be justified in approaching the place where the accident occurred at a speed of 16 miles an hour, and could have attained that speed from rest at the last demand stopping place. Travelling at a speed of 16 miles, the driver would need to apply his brakes about 100 ft. from the place at which he wished to stop. The inquest was again adjourned.

The Glasgow Tramway Difficulty.—Apart from the national dispute which is now the subject of arbitration, Glasgow Corporation Tramways Committee have had difficulties of their own to adjust with the tramway employees. In the early stages of the dispute there was considerable stiffness on both sides, and a strike seemed inevitable. At the end of last week, however, at the meeting of the Town Council, Treasurer Barrie intimated that he now agreed to the whole of the five points raised by the tramway employees going to arbitration. A neutral arbitrator will now be appointed by the Ministry of Labour, to consider the five points regarding hours, etc., of the tramway traffic staff which are in dispute between the department and the employees.

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Resumption of Tramway Services in the Valenciennes Area.—Although Valenciennes as a whole did not suffer to the same extent as its sister towns Douai and Cambrai, the enemy dealt very faithfully with the tramway systems of the neighbourhood. Nearly every rail had received its charge of dynamite, while the overhead cables and wires had been in most cases removed bodily for the benefit of the munition factories beyond the Rhine. In spite of these handicaps, however, the "Compagnie des Chemins de fer économiques du Nord" has not fallen behind other industries in the work of reconstruction, and is able to announce the resumption of full services on the lines Valenciennes-St. Amand, Valenciennes-Denain-Lourches, Valenciennes-Blanc-Misseron, and Valenciennes-Corde-Hergnies-Bonsecours, as from the end of September.

Tramway Shelters for Manchester.—A joint committee of the tramways and public health departments of Manchester Corporation has agreed on plans for the construction of tramway shelters. Two islands with covered shelters will be provided in Hanging Ditch, one shelter at the Grand Lodge entrance to Heaton Park, waiting rooms and public conveniences at the junction of Bury New Road and Waterloo Road, a shelter, etc., at the corner of Old Road and Wilson Street, and an improvement scheme with shelter at the junction of Slade Road and Stockport Road. Progress is being made with the scheme already passed for a shelter outside the Lake entrance to Bellevue, and plans are under consideration for the corner of Lloyd Road and Stockport Road, Levenshulme, and the tramway terminus at Palatine Road and All Saints.

PERSONAL

Mr. Charles Aldington, C.B.E., has been appointed a member of the Railway Executive in the place of the late Mr. Frank Potter. Mr. Aldington will be the representative on the Committee of the Great Western Railway, of which Mr. Potter was general manager until his death.

Messrs. Alfred Ingram & Co., railway material contractors, Queen Anne's Chambers, Westminster, S.W.1, announce that **Mr. A. Douglas Ingram** has joined the firm. After serving with the Engineering Unit of the Royal Naval Division in Gallipoli, Mr. A. Douglas Ingram was appointed as an assistant engineer, Ministry of Munitions, Manchester, and at the time of the Armistice was secretary of the Engineering Department of the N.W. Area, Manchester. His training as an electrical and mechanical engineer on the Metropolitan Railway well fitted him for these positions, and will serve him in good stead in the position he has now taken up.

Mr. H. Campion, manager of the Dewsbury Municipal Electricity and Tramway Departments, has been appointed to a similar joint position under the Chesterfield Corporation, at a commencing salary of £600 per annum. Mr. Campion succeeds Mr. R. L. Acland, who resigned to take up an appointment with a London transport company. Forty-four years of age, Mr. Campion has been in his present post at Dewsbury for close on eighteen years, and previously he held appointments under the Blackburn Corporation and the City of London Electric Light Company. **Mr. W. A. Toppin,** who has been acting as manager of both undertakings since Mr. Acland's resignation, becomes assistant general manager, at £300 per annum, plus £120 per annum war bonus.

FINANCIAL.

G. D. Peters and Co., Ltd.—The quarterly dividend at the rate of 6 per cent. per annum, less income tax, will be paid on the preference shares of the company for the quarter ending September 30, 1919, to all shareholders whose names appear on the company's register on September 20, 1919.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended September 17th amounted to £79,495, an increase of £11,608 as compared with the corresponding period last year. The route mileage was 141.67, the same as a year ago. From April 1st (the commencement of the financial year) to September 17th (twenty-four weeks and two days) the total receipts were £1,972,642, an increase of £393,195 on the corresponding period of 1918.

BUSINESS NOTES.

A Great Firm Changes Its Name.—We are officially informed that the British Westinghouse Electric and Manufacturing Company, Ltd., has changed its name to that of "Metropolitan-Vickers Electrical Co., Ltd.," as from September 8, 1919.

The Duff Jack Sales Company, of Oxford Circus House, 245, Oxford Street, London, W.1, have been appointed sole British agents for the Barrett and Duff lifting jacks, including automobile, locomotive and the heavier types, for use in connection with tramways and railways. Mr. T. W. Cumner, the managing director of the Sales Company, has just returned from Pittsburgh, after spending a considerable time in the works of the Duff Manufacturing Company. He is therefore familiar with the latest developments and improvements in all kinds of lifting gear and is prepared to advise intending users as to the most suitable jacks for special or general purposes.

CONTRACTS AND ORDERS.

Liverpool Watch Committee have decided to accept the tender of Leyland Motors, Ltd., for a petrol motor fire engine for £1,660, delivery to be made in six months time.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAME.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	Sept. 9	548	552	+ 44	23	12,670	+ 689
Aberdeen Corporation	,, 10	2,591	3,659	+ 1,068	14½	521,87	+ 11,706
Ayr Corporation	,, 13	573	771	+ 128	17	15,808	+ 2,224
Belfast City	,12	8,799	10,838	+ 2,039	24	248,004	+ 58,550
Birkenhead Corporation	,, 14	2,255	3,189	+ 934	23½	68,552	+ 15,198
Birmingham Corporation	,, 6	23,760	26,050	+ 2,290	23	587,676	+ 52,316
do. Motor Buses	,, 6	1,462	1,701	+ 249	23	40,528	+ 4,819
Blackburn Corporation	,, 10	1,953	2,696	+ 743	24½	58,186	+ 12,679
Bradford Corporation	,, 6	9,919	11,404	+ 1,485	23	263,626	+ 51,226
Burnley Corporation	,, 13	2,437	3,641	+ 1,204	..	..	..
Burton-on-Trent Cor.	Aug. 31	426	545	+ 119	22	11,023	+ 1,873
Bury Corporation	Sept. 14	1,881	2,437	+ 556	23½	58,609	+ 8,049
Chatham & District	,, 4	1,498	1,753	+ 255	25	53,780	+ 7,399
Cork Electric	,, 4	669	888	+ 219	25	23,742	+ 1,314
Derby Corporation	,, 13	1,514	2,156	+ 642	24	46,857	+ 10,109
Dundee City	,, 10	1,975	2,690	+ 715	16½	44,065	+ 10,622
East Ham Corporation	,, 13	1,614	2,018	+ 404	23½	45,961	+ 9,147
Edinburgh	,, 6	9,215	11,258	+ 2,043	9½	118,655	+ 22,928
Glasgow Corporation	,, 13	29,819	33,348	+ 3,529	15	480,682	+ 49,618
Glossop (U.E. Sup. Co.)	,, 13	166	249	+ 83	37	5,263	+ 1,497
Huddersfield Corporation	,, 13	3,900	5,506	+ 1,606	24	119,141	+ 25,713
Ilford U.D. Council	,, 13	1,025	1,261	+ 236	23½	29,340	+ 5,043
Ipswich Corporation	,, 13	846	1,188	+ 337	24	23,498	+ 4,012
Isle of Thanet	,, 10	756	2,431	+ 1,675	19½	45,016	+ 19,834
Kilmarnock Corporation	,, 13	271	288	+ 17	17½	5,065	+ 620
Lanarkshire	,, 4	3,960	4,215	+ 255	35	126,117	— 486
Leeds City	,, 13	13,889	17,277	+ 3,388	24	403,426	+ 86,456
Leicester Corporation	,, 13	4,783	6,164	+ 1,381	..	..	..
Leyton U.D Council	,, 4	2,498	3,104	+ 606	23	72,990	+ 20,376
Liverpool Corporation	,, 12	18,889	24,844	+ 5,955	36½	798,994	+ 138,722
London County Council	,, 17	67,887	79,495	+ 11,608	24½	1,972,642	+ 393,196
Maidstone Corporation	,, 11	294	474	+ 180	23½	9,479	+ 2,523
Manchester Corporation	,, 13	26,477	31,405	+ 4,928	24	733,356	+ 120,835
Newcastle-on-Tyne Cor.	,, 13	9,150	9,411	+ 261	22	229,225	+ 11,135
Northampton Cor.	,, 5	790	1,332	+ 542	22	29,771	+ 9,673
Nottingham Corporation	,, 11	5,806	7,476	+ 1,670	24	170,722	+ 31,379
Oldham Corporation	,, 14	3,304	4,669	+ 1,365	25	111,417	+ 23,260
Reading Corporation	,, 11	1,426	1,779	+ 353	22½	38,629	+ 6,926
Rotherham Corporation	,, 3	2,584	2,031	— 553	22½	48,930	— 2 355
Sheffield Corporation	,, 14	13,043	7,712	— 5,331	24½	411,238	+ 77,959
Southampton Cor.	,, 10	2,752	2,905	+ 153	23½	65,892	+ 4,268
Southend-on-Sea Cor.	,, 10	2,000	3,345	+ 1 345	24	59,635	+ 24,515
South Shields Cor.	Aug. 2	1,282	1,497	+ 214	18	24,834	+ 4,815
Sunderland Corporation	Sept. 14	2,033	3,059	+ 1,026	24	71,430	+ 20,394
Torquay Tramways	Aug. 16	1,700	2,019	+ 319	32	34,385	+ 16,037
Tyneside Trys. & Trmrds.	,, 27	1,167	1,273	+ 105	9	10,608	+ 278
Wallasey Corporation	Sept. 14	1,922	2,803	+ 881	23½	64,474	+ 16,496
Walsall Corporation	,, 6	1,215	1,641	+ 426	23	32,411	+ 3,915
Walthamstow U.D. Coun.	,, 13	1,416	1,881	+ 465	24	48,158	+ 7,415
Warrington Corporation	,, 11	798	920	+ 122	25	20,837	+ 3,196
West Ham Corporation	,, 11	4,715	5,452	+ 737	23½	128,155	+ 21,066
Wolverhampton	,, 17	1,863	1,983	+ 320	24	49,388	+ 7,006

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Wks.	Aggregate. 1918-19	Increase or Dec.
Anglo-Argentine	Sept. 16	£53,760	£55,832	37	£2,099,585	+ £47,405
Ballarat and Bendigo(4 wks)	July 20	2,948	2,981	16	13,799	+ 324
Brazilian Traction (Mirs.)	July	9,465,000	10,070,000	30	64,033,000	+ 4,875,000
Brisbane	Aug.	42,670	42,245	34	304 400	+ 13,946
British Columbia $	July	413,968	642,090	4	642,090	+ 228,122
Buenos Aires Lacroze	Aug.	41,817	46,845	8	92,068	+ 5,106
Burmah Tram. & Light Rs.	Aug. 31	41,855	43,683	4	43,683	+ 1,828
Calcutta Rs.	Sept. 13	69,394	92,623	36½	..	+ 417,259
Carthagena and Herrerias	Aug.	2,729	2,991	34	23,965	— 11,887
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	Aug.	1,975	2,761	4	2,761	+ 786
Hong Kong $	July 19	15,904	20,205	29	424,836	+ 30,671
Kalgoorlie M		2,767	2,796	22	13,196	— 42
La Plata	July	6,721	5,317	31	32,774	+ 2,840
Lima	June	42,161	47,811	26	282,907	+ 26,682
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras Rs.	Sept. 12	35,470	51,193	26	609,485	+ 18,079
Manila $	June	183,250	160,670	26	1,207,412	+ 170,313
Montevideo	July	31,684	34,189	39	334,076	+ 32,551
Para	July	24,398	24,659	34	196,736	+ 2,802
Pernambuco	Sept. 14	4,294	5,582	36½	187,621	+ 23,644
Peruvian $	July	987,300	1,058,780	..	..	..
Rangoon	Aug.	5,760	6,472	34	51,660	+ 2 147
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore $	Aug. 9	15,157	15,601	32	488,898	+ 51,272
Toronto $	July	1,049,936	977,262	30	7,110,558	— 295,547
Winnipeg $	July	288,155	337,978	30	2,212,618	+ 113,128

CARS, MOTORS, CONTROLLERS.

(DICK, KERR SYSTEM.)

THE ENGLISH ELECTRIC COMPANY LIMITED,

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THE
Tramway AND Railway World

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SATURDAY, SEPTEMBER 27, 1919.

ARBITRATION IN A HURRY.

SHAKESPEARE made a proverb on "the law's delays," but if he had lived in the present day, he might have made a more pungent epigram on legal and legislative haste. Legal processes are necessarily slow if the issues are complex and the evidence voluminous, because each point must be clearly defined and every particle of evidence carefully weighed. If there is any form of legal process in which circumspection is more desirable than in any other, it is arbitration court procedure. An arbitration court is called upon to adjust the differences between the contending parties, and the assessors must be able to understand the point of view of each appellant, sift the evidence submitted on both sides, and form their judgment accordingly, if the award is to be of any value. No one can honestly say that the Interim Court of Arbitration, at present taking evidence on the questions at issue between the owners of tramway undertakings and the tramway workers, approaches that ideal. On the contrary, the procedure is characterised by a haste which precludes all reasonable hope of a decision being shaped by evidence. Whatever the judgment of the Court may be, it is humanly impossible for it to be based on the evidence offered and available. At the session of the Court held in London on Tuesday, there were represented four omnibus companies, the Conference of Tramway and Light Railway Companies, for ten members, the Municipal Tramways' Association, on behalf of 21 municipalities, and in addition several companies and municipalities appeared as individuals. Speeches were made by representatives of the Workers' Union, and then on behalf of the London County Council, Mr. A. L. C. Fell, general manager of the tramways, made a long and detailed statement giving rates of pay, increases in expenditure involved, comparisons of the wages of tramwaymen with those of skilled workers, and many other facts, each one demanding the most careful consideration and examination. Next, representatives of Ipswich, Colchester, Erith, West Ham, and other municipal undertakings were heard. Still other authorities and the representatives of the omnibus companies had no time to present their case, as the members of the Court of Arbitration had to set off for Bristol that night. It was consequently arranged that the proceedings in London should be resumed on the following Tuesday. The same breathless procedure characterised the sittings at Manchester. At Glasgow to-day, Newcastle, West Hartlepool, Glasgow, and other important municipalities are to be heard individually. At Manchester, in addition to 18 companies, there were 41 municipalities considered yesterday. What purpose the Minister of Labour hopes to serve by the Interim Court it is impossible to say with certainty, but it seems at present that if he had wished to bring the Arbitration Court itself into utter contempt, he could not have devised a more effective method. Quite possibly the Minister has used reference to the Interim Court as a thick pad to ward off the bludgeon-blows of labour from the tramway undertakings of the country. On the other hand, it is greatly feared that Sir Robert Horne has adopted that course as an excuse for granting the Transport Workers' Federation concessions not economically justifiable. Conjecture is fruitless amid such a vague element, but the actual procedure of the Interim Court of Arbitration borders closely on farce.

DODGING THE QUEUE.

A question of considerable interest to tramway authorities and omnibus proprietors was raised last week at Barnet Petty Sessions. Two men were charged with refusing to leave a tramcar at the Barnet terminus, and using insulting language and behaviour to the police who ejected them at the instance of the car conductor. It appears that the defendants, in order to make sure of their seats on their return journey, boarded the car at the last penny stage of the outward journey, and retained their seats. The conductor told them, however, that they must alight and take their places at the end of a queue of over a thousand people already gathered at the terminus, and when they refused, obtained the assistance of the police in ejecting them. Furious at such treatment, the young men, it is alleged, used insulting language.

Alderman Pank, the presiding magistrate of the court, asked whether the tramway authority had the right under their by-laws, to eject a passenger at the terminus, given that he was willing to pay the fare for the next stage on demand.

Mr. Excell, who appeared for the Metropolitan Electric Tramways Company, said he could find nothing in the by-laws relative to the point, but section 51 of the General Tramway Act of 1870 read :—"If any person knowingly and wilfully refuses or neglects on arriving at the point to which he has paid his fare to quit such carriage every such person shall for every such offence be liable to a penalty not exceeding 40s."

After consultation with his colleagues, the chairman said there was a knotty point which the Bench would not decide that day, and as the defendants had twice appeared before the Court in connection with this offence they would be discharged.

INCREASES IN FARES.

Dundee Town Council have agreed to an increase in the tramway fares. Over the longer distances the increase will be a halfpenny. It was mentioned that for the current year the estimated working expenses showed an increase of £15,000, of which £12,000 was for wages. Since pre-war days the wage bill had gone up by £30,000.

Birkenhead Tramways Committee propose a further increase of fares. The minimum is to be 1½d., and the average per mile will be a like sum.

Hull Corporation have referred back for further consideration a proposal by the Tramways Committee to abolish halfpenny morning fares.

Blackpool Tramways Committee propose to increase the fare on the circular route from 4d. to 6d.

Yorkshire (Woollen District) Electric Tramways Company have increased all 1d. fares, except on one route, to 1½d.

Newcastle Tramway Proposals.—The Parliamentary Committee of Newcastle City Council have presented a report foreshadowing the promotion of a Parliamentary Bill, containing provisions in which powers are sought for carrying the tramways over the High Level Bridge, and connecting the Newcastle and Gateshead tramway systems. It is proposed to include also in the Bill powers to establish an omnibus service to Seaton Burn, and to acquire strips of land for the widening of the Benton and Whitley main road, to render it suitable for tramway traffic.

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NATIONAL TRAMWAY ARBITRATION

The Interim Court of Arbitration under the Wages (Temporary Regulation) Acts, 1918 and 1919, consisting of Sir William Mackenzie (chairman), Col. Denny and Mr. F. S. Button, sat in Committee Room B in the Central Hall, Westminster, on Tuesday, September 23, to hear the claim made by the National Transport Workers Federation for an increase in wages for their members employed by the tramway and omnibus undertakings. The claim is for an increase of 12s. per week in the case of employees of 18 years of age and over, and 6s. per week in the case of employees under 18 years of age. The merging of war bonus into permanent wages and the reduction of the qualifying period for the maximum wage were by consent, withdrawn from the terms of reference.

The parties to the arbitration are the Conference of Tramway and Light Railway Companies, the Municipal Tramways' Association the London General Omnibus Company, Ltd., the British Automobile Traction Company, Ltd., the National Steam Car Company Ltd., and Messrs. Thomas Tilling, Ltd., on the one hand, and on the other the National Transport Workers' Federation, and its affiliated unions providing for tramway and omnibus workers.

As a result of the preliminary hearing on September 15, the Court had decided to proceed with the hearing of the application for the country as a whole in the same way as in other similar cases that had come before them. At the same time, with a view to meeting the convenience of witnesses, they arranged to sit successively in London, Bristol, Manchester and Glasgow, on the dates specified below :—

London, Tuesday, September 23, 10 a.m., Central Hall, Westminster. (The undertakings concerned in this hearing included 4 motor omnibus companies, 10 tramway companies and 21 corporation tramways.)

Bristol, September 24, 10.30 a.m., Council Chamber. (The undertakings included 8 tramway companies and 8 corporation tramways.)

Manchester, September 26, 10 a.m., Town Hall. (Eighteen tramway companies and 41 corporation tramways.)

Glasgow, Saturday, September 27, 10.30 a.m., Christian Institute. (Eleven tramway companies and 7 corporation tramways.)

At the hearing on Tuesday there was a large attendance of representatives of tramway undertakings, and the Unions affiliated to the Transport Workers' Federation were also strongly represented. Sir Lynden Macassey, K.C., appeared for the municipal and company owned tramways with Mr. J. M. McElroy and J. Beckett (general secretary of the Municipal Tramways Association). The case for the workers was stated by Messrs. Robert Williams, Bevan, Hirst, and B. Smith. The following presented the case for their respective authorities :—A. L. C. Fell, general manager, London County Council Tramways ; Frank Ayton, general manager and engineer, Ipswich Corporation Tramways ; Councillor A. M. Jarmin, chairman Colchester Corporation Tramways Committee ; Councillor Kensett, West Ham Corporation Tramways Committee ; F. Schofield, manager, Leyton District Council Tramways ; J. C. Williams, general manager, Erith District Council Tramways : A. W. Chivers, Worcester Electric Traction Company ; F. E. Saunders, Luton Tramways (Messrs. Balfour, Beatty and Company) ; R. J. Howley, chairman, Potteries Electric Traction Company.

Sir Lynden Macassey said the total amount of wages involved in the arbitration was three millions per annum in addition to the bonuses already granted.

The evidence tendered for the London County Council showed that fares had been increased to the point of equilibrium, and could not economically be raised higher. It was stated that all sections of the community had sent in protests against the raising of the fares, and 120 petitions had been received. It was also declared that the L.C.C. tramway undertaking would at the present pace come on the rates.

In the cases of Ipswich and Colchester, it was shown that those undertakings are on the rates with the prospect of a greater demand from that source to meet the deficiencies involved. In the case of West Ham, it was stated that the rates were now bearing 10d. in the £ for tramway losses, and the total rate for the current year would amount to 15s. 7d. in the £. In the other cases considered, it was shown that tramways were now involving a loss which was being borne by the ratepayers.

The evidence for the authorities mentioned above occupied the whole of the day, and as the Court had to proceed to Bristol the same evening, the hearing of the representatives of other London undertakings was postponed until Tuesday, September 30.

The original plan of the Court was to complete the hearing this week and to give their decision without delay, but in view of the large number of parties to be heard, it quickly became evident that the plan was quite impracticable and that the proceedings would necessarily be protracted. It is understood, however, that the Court are anxious to give their decision with the least possible delay.

The undertakings represented at Bristol on Wednesday included those of Bristol, Bath, Camborne and Redruth, Weston-super-Mare, Cardiff, Exeter, Newport, Pontypridd and Gloucester. Details were furnished the court of the conditions prevailing in the several localities, and some of the municipal authorities submitted estimates of the serious financial effect the granting of the present application would have upon their undertakings in some instances involving a contribution from the rates, and in other cases subsidies in addition to those already required. The hearing of the numerous cases took a considerable time and the court adjourned.

OVERTURNED L.C.C. TRAMCAR.

THE DRIVER COMPLIMENTED.

On Saturday, September 20, the inquest on the two men killed by the overturning of an L.C.C. tramway car near St. Pancras Station, on August 16, was resumed. After considering the evidence, the jury brought in a verdict of "Accidental death." In announcing their decision, the foreman of the jury added that they were of opinion that the driver was in no way responsible for the accident, and they wished to compliment him on having stuck to his post till the tramcar was overturned. They were further of the opinion that the speed of all tramway cars travelling down the curve to the corner of Great College Street should be reduced considerably from the speed at which they are now driven.

MISCELLANEOUS NEWS AND NOTES.

Price of Current at Lowestoft.—Lowestoft Corporation tramways are in future to pay 2d. per unit for energy obtained from the municipal lighting station.

London-Brussels Air Service was opened on Monday, September 22, with Handley-Page machines. Ten passengers, with 30 lbs. each of personal luggage, in addition to 500 lbs. of goods, can be carried.

Exeter City Council have decided to purchase three electric vehicles for refuse collection at a cost of £1,304 each. It is estimated that the Council will thereby be able to effect a saving of 2s. 7d. a ton on cartage.

Vienna Tramways Suspended.—Owing to the shortage of fuel, the authorities of Vienna have suspended all tramway services since September 21, and taken other stringent measures to reduce coal consumption in the city.

Golcar Urban District Council have appointed a small deputation to meet Huddersfield Tramways Committee to discuss the question of a motor-bus service between Golcar and Huddersfield.

Brighton Extension Proposals.—The Tramways Committee of Brighton Town Council have recommended the extension of the tramway track to Lewes Road, as far as the borough boundary, near which a garden suburb is being created for the accommodation of the workers in a local factory and the new diamond works.

High Rates at West Ham.—The West Ham Town Council has increased the rate by 2s. 3d. in the £, and the total rate for the year ending March, 1920 will be 15s. 7d., as against 14s. for the year ended March, 1919. There will be a heavy loss on the tramways.

Extension Proposals at Pontypridd.—At a recent meeting, Pontypridd Town Council decided to apply for Parliamentary powers to extend their tramways to Rhydfelin and Upper Boat. Mr. W. E. Low, engineer and surveyor, suggested that the new route should be constructed on the site of the old Doctor's Canal, with a sleeper track.

Motor Lorries for the Railways.—It is stated that the Government is arranging to rent a number of motor lorries to the railways with a view to relieving the congestion at railway depots and the docks. The use of lorries will probably be extended later to inland congested areas. The drivers of the vehicles are to be provided by the railway companies.

Superannuation for Tramway Employees.—In view of the superannuation scheme proposed by the Glasgow Town Council for tramway employees of the Corporation, a mass meeting of tramway workers was held on Wednesday, September 24, and a deputation representing various sections appointed to confer with the Town Council Committee on the subject.

The Tramways and Light Railways Association.—The *Journal* for September contains the papers on "Notes on Tramway Fares and Services," by Mr. W. L. Madgen, and on "Post War Problems," by Mr. H. England, general manager, Yorkshire (West Riding) Tramways Company, read at the annual congress on July 25, together with reports of the discussions.

Effect of a Broken Axle.—The axle of a London County Council tramcar broke one day last week, in Kennington Park Road, during the busiest rush period. The traffic had to be diverted, and the city-bound cars taken round by Vauxhall and Lambeth, rejoining the regular route at St. George's Circus. Within an hour or so, however, the car was removed and the regular traffic restored.

End of Summer Time.—The Home Secretary has given notice that Summer time will case and normal time will be restored at 3 a.m. (summer time) on Monday, September 29, when the clock will be put back to 2 a.m. All clocks should therefore be put back one hour on the night of Sunday-Monday. The Government request employers to warn all their workers in advance of the change of time.

Without a Rear Light.—At an inquest held at Grimsby on Thursday on the body of a woman, who was killed through a collision with a motor car while cycling at night, the Coroner said that he did not think the accident would have happened if she had had a rear light on her machine. The jury asked him to write to the Home Office on the subject, with a view to the rear light regulation being reinstated.

Transport Workers' (Docks, etc.) Demands.—A conference of transport workers in London on Thursday, under the chairmanship of Mr. J. Sexton, M.P., adopted a recommendation of the executive council of the federation that a minimum rate of pay for all dock, wharf, and riverside employees handling general cargo be established at the rate of 16s. per day for day workers, with a proportionate advance in tariff rates for piece-workers.

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Manchester Tramways Committee's Vast Schemes.—Outlines of a scheme of tramway extensions, estimated to cost somewhere between one and two million pounds, have been submitted by the Tramways Committee for inclusion in the Improvements Bill which is to be promoted by Manchester Corporation next session in Parliament. The proposals comprise widenings of old streets, the making of a network of new roads, and the construction of terminals to relieve congestion at central points in the city.

Teeside Railless Traction Board.—Representatives of the Middlesbrough Corporation and the Eston Urban Council met at Middlesbrough on September 22 as the Teeside Railless Traction Board. Mr. J. T. Belk, clerk to the Eston Council, reported that it had been arranged that the transfer of the undertaking to the constituent authorities of the board should take place on October 22. Seven cars are now ready and test trials have proved entirely satisfactory. A Board of Trade inspection would, however, be necessary before the service could be inaugurated.

Chars-à-bancs as Supplements to Tramways.—At a recent meeting of Edinburgh Town Council, Messrs. White and Deas gave notice of motion to remit to the Tramway Committee to consider the running of an express service of motors at stated times on several tramway routes. Messrs. Brown and Crichton gave notice of motion to remit to the Tramway Committee to consider when the motor chars-à-bancs supplying the two new tourist routes were suspended for the season the advisability of experimentally running them over routes inadequately served by the tramways.

Tramwayman Receives Electric Shock.—An accident which contains a warning to tramway operators occurred on the southern section of the London County Council tramways. His car having been halted on the dead section of the line at New Cross Gate, a tramwayman touched the plough. At the same moment, another tramcar arriving moved the stationary vehicle on to the live section of the line, and the man being in contact received the full force of the electric current. He fell unconscious from the shock, but it is satisfactory to learn that he is now progressing towards recovery.

Greenock's Option to Purchase.—At the meeting of Greenock Town Council, on Thursday, September 18, it was moved that the Town Clerk be instructed to give notice to the Greenock and Port Glasgow Tramways Company that the Corporation have decided to exercise their option to terminate on May 15, 1921, the lease of the Company at the second break which occurs on that date. An amendment was moved that no action be taken until the members had before them the report of the Council Committee which was enquiring into the whole matter. The amendment was carried by a large majority.

Complaints Against Dublin United Tramways.—At Pembroke Urban Council meeting recently, a letter was read from the secretary of Dublin United Tramways Company, in reply to the complaints of the Council regarding the services to Sandymount and the state of the roads. He regretted that the service on the Sandymount via Bath Avenue section could not be restored, but stated that steps were being taken to augment the service to Sandymount via Ringsend. After discussion, it was resolved to appeal to the Board of Trade, and to consult the Council's legal adviser as to what could be done to compel the Company to repair the roads.

Railway Electricians and Holidays.—The award was issued on September 24 of the arbitration inquiry into the claims of the Electrical Trades Union that the same holiday conditions already agreed to for workers in the general electricity undertakings of the London district should be applied to the men employed in the electricity departments of the railway companies operating in the London area. At the hearing it was contended by the railway companies that the men concerned formed part of the general body of railway workmen, and that their holiday conditions should be regulated by those governing the general body. The Court decided that the claim had not been established.

Increased Wages of Belfast Motor Drivers.—Though on the other side of the Irish Channel, Belfast vehicle workers are taking their share in the increased wages movement. At a conference held last week between representatives of the employers and the officials of the Transport Vehicle Workers' Federation, it was agreed that all classes of motor drivers be paid a minimum wage of £3 per week. It was further agreed that men at present in receipt of higher pay should not have their wages reduced but should receive the weekly advance of 4s. on war wages as settled some time ago. It is understood that the new scale applies to all drivers of commercial motors in Belfast, and that in some cases it will represent an increase of from 10s. to 15s. a week.

Renewal of Ayr Tramway Track.—At a recent meeting of Ayr Town Council, a minute of the Tramway Committee was read and passed, which stated that "There had been issued to each member prior to the meeting a report prepared by the engineer on the condition of the tramway track, and showing what is required to put it in good order. He estimates the cost of renewing the track from St. Leonard's Church to Newton Station, including passing places, etc., at fully £38,400. He recommends the advisability of renewing the present double track from Newton Station to the car sheds, and also of renewing in double track the present single track from the car sheds to Prestwick Toll. He estimates that these works will cost an additional £15,500. It was agreed to ask Mr. Ferguson, the engineer of the Glasgow Corporation Tramways, to examine the track and to advise to what extent the rails should be renewed and in what order the work of renewal should be proceeded with."

Bradford Rolling Stock.—In the report of the General Manager of the Bradford Corporation Tramways for the last financial year it is mentioned that the high power tramway car motors which were ordered early in 1915 from Messrs. Brown, Boverie and Company have not yet been delivered, and the older motors have proved unequal to carrying the heavy traffic of the past year. Due to the overloading of these motors there has been an extraordinary number of failures, and the greatest difficulty has been experienced in obtaining material and labour to maintain sufficient cars in service. Twenty-six new cars with high power motors of modern design have been ordered, together with fifty-two pairs of motors and electrical equipment, which will replace the older motors. The Corporation now has 232 tramway cars and 17 railless trolley vehicles.

Lord Weir on Industrial Unrest.—The International Shipping Engineering and Machinery Exhibition was opened at Olympia, on Thursday, by Lord Weir, who delivered a remarkable speech on the industrial unrest. His main points were: Our emergency to-day is as great as it was in August, 1914. In the labour world are two distinct policies—one seeking to improve with legitimate aspirations and ideals, and the other a movement for nationalisation. There must be a development of systems of payment by results, but the employers must remember the human side, which calls for tolerance and sympathy. The necessity for the directional authority in workshop methods and conditions must, however, be recognised. In the National Industrial Councils we have a wise and statesmanlike conception. The exhibition will remain open until October 17.

The Ministry of Transport.—The powers of the Board of Trade relating to railways were formally transferred to the new Ministry of Transport on Monday, September 22. The offices of the Ministry over which Sir Eric Geddes presides are at 6, Whitehall Gardens, S.W. The members of the Railway Executive Committee, in view of the inauguration of the Ministry, offered their resignation to the new Minister, but Sir Eric Geddes, in reply, requested the Committee to continue to serve for the present. He added that he looked forward to the creation of an organisation which would enable the Committee to continue to give their assistance to the Ministry. The Railway Executive Committee came into being with the declaration of war in August, 1914, although a nucleus of such a Committee had existed for a number of years previously. For the purposes of the war our railways proved splendidly efficient and the services of the Committee were of inestimable value.

PERSONAL.

Mr. C. B. Simpson has joined the board of directors of Mather and Platt, Ltd.

Lieutenant-Colonel Sir Rhys Williams, Bt., D.S.O., K.C., M.P., has been appointed Parliamentary Secretary to the Ministry of Transport.

Mr. R. R. Blake has been appointed general manager of the Gravesend and Northfleet Tramways and the North Kent Motor Omnibus Services Company.

Mr. Arthur Brown, city engineer of Nottingham, proposes to retire from his office, which he has held for almost thirty-nine years. He will be retained as consulting engineer to the Corporation.

Mr. H. O. Davis has resigned his position as manager of the publicity department of John I. Thornycroft and Co., Ltd., in order to take up an important appointment with Vickers, Ltd. He will still continue to act as honorary secretary to the Society of Motor Advertising Managers.

Mr. Theodore P. Schonts, who since 1907 has been president of the Interborough Consolidated Corporation, which controls the greater part of the various tube railway services, the elevated electric railways, and the tramcar lines in New York City, died in New York on September 21.

Mr. James Blake Concannon, of 98, Piccadilly, S.W., and of Rockfield, Athenry, Galway, Ireland, a member of the firm of J. B. Concannon and Company, stockbrokers, 28, Austin Friars, E.C., chairman of the Anglo-Argentine Tramways Company, and a director of the Brisbane Electric Tramways Investment Company and the Brisbane Tramways Company, who died on August 12, aged 69, has left a fortune of the value of £133,700, the net personalty amounting to £126,392.

Mr. R. McKean Cant, F.C.I., advertising manager of the B. F. Goodrich Co., Ltd., will conduct a class in advertising and salesmanship in Queen's Road Senior Commercial Institute, Dalston, London, E.8, every Tuesday evening this session from 7.30 to 9.30, beginning on Tuesday, September 23rd, and also a class in the same subjects in Highbury Commercial Institute, Laycock Street, Upper Street, Islington, N.1, every Wednesday evening this session from 7.30 to 9.30, beginning on Wednesday, September 24. A copy of the prospectus of the particular institute concerned can be obtained either from Mr. Cant or from the Principal of the institute most convenient for the student.

CONTRACTS AND ORDERS.

The English Electric Company have an order from Bolton Corporation for eight tram car equipments.

Preston Tramways Committee have accepted the tender of Messrs. Hadfields, Ltd., of Sheffield, for the supply of points and crossings for the Lancaster Road Junction, for the sum of £1,098.

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FINANCIAL.

The Metropolitan-Vickers Electrical Export Company was registered on September 19 with a capital of £100,000 in £1 shares to carry on the business of dealers in, and exporters of, electrical plant and machinery. The first directors are Sir E. W. Smith, John E. Hutton, Horace Lloyd, and R. S. Hilton. The registered offices are at 2, Westinghouse Buildings, Norfolk Street, London, W.C.2.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended September 24th amounted to £78,080, an increase of £8,999 as compared with the corresponding period last year. The route mileage was 141.67, the same as a year ago. From April 1st (the commencement of the financial year) to September 24th (twenty-five weeks and two days) the total receipts were £2,050,714. An increase of £402,186 on the corresponding period of 1918.

Dundee, Broughty Ferry and District Tramways Co.—The annual report of this company states that the surplus for the year amounts to £5,653, from which there falls to be deducted interest on debenture stock and interim dividends paid on preference shares for the half-year, leaving a balance of £3,400, which the directors propose to deal with as follows:—Final dividend on preference shares at the rate of 6 per cent. per annum for half-year (less tax), and dividend on ordinary shares at the rate of 5 per cent. per annum for year (less tax); to reserve fund, £1,000; to carry forward to next account, £344.

Bradford Corporation Tramways.—The report of the general manager (Mr. R. H. Wilkinson) for the year ended March 31, 1919, which has just been issued, states that notwithstanding the difficulties a fairly efficient service was maintained throughout the year, and with the prospect of deliveries of new cars and equipment in the near future there is every reason to hope that the efficiency of the service will gradually improve. Before the undertaking can be restored to its pre-war efficiency, however, further expenditure on cars and equipment, and repairs and renewal of track will be necessary. For this purpose a strong reserve fund should be accumulated. We append a comparative summary of the year 1918-19 with the two preceding years and the year 1913-14.

	1918-19.	1917-18.	1916-17.	1913-14.
INCOME—	£	£	£	£
Traffic revenue	456,818	366,495	326,406	297,019
Sundry receipts	10,025	10,414	7,185	8,724
Total income	466,843	376,909	333,591	305,743
EXPENDITURE—				
Traffic expenses	133,094	115,793	99,722	82,842
General expenses	32,287	28,438	27,128	27,184
Repairs and maintenance	90,661	64,725	46,506	56,214
Power expenses	55,765	52,981	52,514	50,378
Miscellaneous expenses	6,024	5,836	4,529	4,201
Total working expenses	317,831	267,773	230,399	220,819
War allowances	27,702	22,231	14,352	—
	345,533	290,004	244,751	220,819
Balance carried to net revenue	121,310	86,905	88,840	84,924
Profit from Parcels Dept.	—	791	311	1,059
Interest, etc.	4,278	2,266	1,167	3,878
	125,588	89,962	90,318	89,861
Less—				
Loss on railless system*	2,036	513	585	1
Loss on Parcels Dept.	102	—	—	—
Deductions—				
Interest	22,062	21,553	20,255	20,443
Income-tax	14,452	10,193	10,693	3,888
Rents	3,492	3,502	3,693	4,259
Net profit	83,444	54,201	55,092	61,270
Appropriated as follows				
Sinking Fund	22,617	22,825	24,289	31,822
Relief of City Rate		10,000	3,400	17,200
Reserve, Renewals etc.,	60,827	21,376	27,402	12,248
	83,444	54,201	55,092	61,270
Mileage of track	108¾	108¾	108¾	106
Car mileage	4,925,822	5,534,858	5,728,982	6,206,239
Units per car mile	2.094	2.101	2.018	1.894
Traffic receipts per car mile	22·257d.	15·892d.	13·674d.	11·486d.
Power cost per car mile	2·717d.	2·297d.	2·200d.	1·984d.
Traffic revenue per mile of single track	£4,201	£3,371	£3,002	£2,792
Expenses per car mile	16·542d.	12·322d.	10·063d.	8·376d.
Passengers carried	76,419,459	84,129,252	77,074,546	67,675,166
Fare per passenger	1·482d.	1·079d.	1·049d.	1·058d.
Ratio of expenses	75·88%	78·32%	75·12%	73·13%
Number of cars in stock	232	233	234	245

* Loss on working.

Bolshevists on Egyptian Tramways.—According to the Cairo correspondent of *The Times*, the tramway difficulty, which has been widespread in Egypt, is in a fair way to a satisfactory solution. A compromise arrangement to last a month has been arrived at, and during that time it is hoped that all the alleged grievances of the tramwaymen will have been settled. Cairo services have been resumed, and negotiations at Alexandria and other places will bring about an immediate resumption of work. Although the compromise arranged does not recognise the men's unions, the Government are contemplating the promulgation of laws which will confer a legal status on those organisations in Egypt. On the other hand, however, action is being taken against the political Bolshevist agitators who have been responsible for the prolongation of the deadlock and aggravation of the industrial situation generally. An Italian journalist, long notorious in Egypt, has been ordered to be expelled, and it is reported that others will be similarly dealt with.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAME.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	Sept. 16	508	567	+ 59	24	12,671	+ 542
Aberdeen Corporation	,, 17	2,602	3,413	+ 811	15½	55,604	+ 12,518
Ayr Corporation	,, 20	501	1,526	+ 1,025	16	17,334	+ 3,209
Belfast City	,, 19	8,757	10,638	+ 1,881	25	256,642	+ 60,731
Birkenhead Corporation	,, 21	2,364	2,834	+ 470	24½	68,896	+ 13 178
Birmingham Corporation	,, 13	34,079	26,327	+ 2,248	24	614,004	+ 54,564
do. Motor Buses	,, 13	1,328	1,871	+ 473	24	42,400	+ 5,992
Blackburn Corporation	,, 10	1,952	2,696	+ 743	24½	58,186	+ 12,679
Bradford Corporation	,, 20	9,600	11,398	+ 1,798	25	286,921	+ 55 764
Burnley Corporation	,, 20	2,825	3,017	+ 692	..	..	..
Burton-on-Trent Cor.	,, 21	422	529	+ 107	25	12,624	+ 2,214
Bury Corporation	,, 21	2,190	2,415	+ 225	24½	61,024	+ 8,274
Chatham & District	,, 11	1,450	1,855	+ 405	26	55,635	+ 7,804
Cork Electric	,, 11	680	979	+ 299	26	24,721	+ 1,613
Derby Corporation	,, 20	1,505	2,002	+ 497	25	46,859	+ 10,606
Dundee City	,, 17	1,962	2,627	+ 665	17½	46,692	+ 11,286
East Ham Corporation	,, 20	1,585	2,027	+ 442	24½	47,989	+ 9,559
Edinburgh	,, 13	8,535	10,944	+ 2,409	10½	129,599	+ 25,337
Glasgow Corporation	,, 20	29,114	33,814	+ 4,200	16	514,296	+ 58,526
Glossop (U.E. Sup. Co.)	,, 20	165	228	+ 63	26	6,481	+ 1,560
Huddersfield Corporation	,, 20	3,872	4,769	+ 897	25	122,911	+ 26,610
Ilford U.D. Council	,, 20	1,085	1,214	+ 129	24½	30,555	+ 5,217
Ipswich Corporation	,, 20	911	1,027	+ 116	25	24,526	+ 4,167
Isle of Thanet	,, 17	654	2,181	+ 1,527	50½	47,198	+ 31,362
Kilmarnock Corporation	,, 20	276	294	18	18½	5,360	+ 638
Lanarkshire	,, 11	3,956	4,303	+ 347	26	130,120	— 140
Leeds City	,, 20	14,097	16,508	+ 2,411	25	419,936	+ 80,160
Leicester Corporation	,, 20	4,724	5,795	+ 1,071	..	..	..
Leyton U.D Council	,, 4	2,428	2,104	+ 606	23	72,990	+ 20,376
Liverpool Corporation	,, 20	18,889	24,251	+ 5,362	27½	823,245	+ 144 084
London County Council	,, 24	69,081	78,080	+ 8,999	25½	2,050,714	+ 402,186
Maidstone Corporation	,, 18	329	445	+ 116	24½	9,924	+ 2,639
Manchester Corporation	,, 20	26,698	30,530	+ 3,832	25	763,896	+ 124,922
Newcastle-on-Tyne Cor.	,, 20	9,231	9,204	— 27	23	238,439	+ 11,107
Northampton Cor.	,, 19	862	1,297	+ 435	25	32,211	+ 10,458
Nottingham Corporation	,, 18	5,708	7,114	+ 1,316	25	177,837	+ 32,696
Oldham Corporation	,, 21	3,607	4,487	+ 880	26	115,904	+ 24,140
Reading Corporation	,, 18	1,411	1,672	+ 261	24½	40,301	+ 7,156
Rotherham Corporation	,, 3	2,584	2,031	— 553	22½	48,930	— 2,355
Sheffield Corporation	,, 21	14,057	11,250	— 2,807	25½	422,488	+ 75,152
Southampton Cor.	,, 17	2,708	2,790	+ 82	24½	68,684	+ 4,350
Southend-on-Sea Cor.	,, 17	1,767	2,958	+ 1 191	25	62,593	+ 25,706
South Shields Cor.	,, 13	1,168	1,531	+ 363	24	34,485	+ 6,309
Sunderland Corporation	,, 21	2,097	2,835	+ 738	25	74,265	+ 21,131
Torquay Tramways	Aug. 14	1,700	2,019	+ 319	32	34,386	+ 6,037
Tyneside Trys. & Trmrds.	Sept. 3	1,094	1,201	+ 107	10	11 809	+ 285
Wallasey Corporation	,, 20	1,780	2,588	+ 808	24½	67,062	+ 17, 103
Walsall Corporation	,, 20	1,185	1,622	+ 457	25	35,672	+ 6,751
Walthamstow U.D. Coun.	,, 20	1,505	1,750	+ 245	25	44,909	+ 7,689
Warrington Corporation	,, 18	784	888	+ 104	24	21,736	+ 3,300
West Ham Corporation	,, 18	4,719	5,213	+ 494	24½	133,368	+ 21,560
Wolverhampton	,, 24	1,714	2,156	+ 442	25	51,545	+ 7,448

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Sept. 23	460,741	561,846	38	£2,161,429	+ £48,508
Ballarat and Bendigo	(4 wks) July 20	2,948	2,961	16	13,799	+ 324
Brazilian Traction (Mirs.)	July	9,465,000	10,070,000	30	64,033,000	+ 4,875,000
Brisbane	Aug.	42,670	42,245	34	304,400	+ 13,946
British Columbia	$ July	413,968	642,090	4	642,090	+ 228,122
Buenos Aires Lacroze	Aug.	41,817	46,845	8	92,068	+ 5,106
Burmah Tram. & Light	Rs. Aug. 31	41,855	43,683	4	43,683	+ 1,828
Calcutta	Rs. Sept. 20	73,915	93,591	37½	..	+ 436,935
Carthagena and Herrerias	Aug.	2,729	2,991	34	23,965	— 11,887
Cordoba	Feb.	12,972	13,549	48	159,208	+ 11,492
East India	Aug.	1,975	2,761	6	2,711	+ 786
Hong Kong	$ July 19	15,904	20,205	19	424,836	+ 30,671
Kalgoorlie	May	2,767	2,796	22	13,196	— 42
La Plata	July	6,721	5,317	31	32,774	+ 2,840
Lima	July	45,964	49,025	30	331,932	+ 29,742
Lisbon	Escu Mar.	288,299	276,625	..	..	..
Madras	Rs. Sept. 15	35,470	51,193	36	699,455	+ 18,039
Manila	$ June	183,250	160,670	26	1,207,412	+ 170,313
Montevideo	July	31,684	34,139	39	334,076	+ 33,551
Para	July	24,398	24,659	34	196,736	+ 2,802
Pernambuco	Sept. 21	4,322	6,196	37½	192,828	+ 25,513
Peruvian	$ July	987,300	1,058,730	..	..	..
Rangoon	Aug.	5,760	6,472	34	54,660	+ 2,147
Shanghai (2 weeks)	$ Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore	$ Aug. 9	15,157	15,601	32	488,596	+ 51,273
Toronto	$ July	1,049,936	977,262	30	7,110,558	— 295,547
Winnipeg	$ July	288,155	337,978	30	2,212,618	+ 118,125

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THE
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SATURDAY, OCTOBER 4, 1919.

AN AUTOMATIC SAFETY VALVE.

There is a fairy story told to the effect that a great engineering genius was employed when a boy to open and shut the valve of a pumping engine. He noted that a cord tied to another part of the engine operated the valve at the proper moment and by automatic action. Therefore he fixed the cord, and obtained ample leisure. How much fact is in the story does not matter for the moment, but the moral of it is very precious. Without flattering them too much, it may be admitted that the workers are the driving force of industry, and, like every other element, that force must be governed and utilised according to its nature. During the past ten years or more, labour troubles have taken up the time and thought of tramway managers and tramway committees to such a degree that their proper business of conducting the operation of the undertakings has often been a kind of leisure occupation, a work to be done after hours, so to speak. Urgent questions of renewals, tracks, extensions, time-tables, and administration may be in course of solution, when labour presents a new demand or formulates another grievance claiming immediate attention. In an interview with a press representative the other day, Mr. C. J. Spencer, manager of the tramway systems associated with the London Underground Electric Railway Company, put the matter in a nutshell. "Nine-tenths of my time," he said, "is spent in dealing with labour problems, threats of strike, and all sorts of labour complications." The urgent need of the tramway world at the present time is an automatic safety valve for the uncontrolled surplus energy of labour, some kind of organ through which it can be rendered harmless, and, if possible, self-adjusting and useful. It was for this purpose the Whitley Councils were devised, and tramway authorities have loyally accepted the duty of organising those councils. Under any circumstances, organisation so detailed and involving so many interests takes time, and in the present condition of affairs the delay is enhanced. Tramway workers have not been patient, to say the least; it may even be said with truth that they have been selfishly inconsiderate of the welfare of the general community. To apportion blame, however, will do nothing towards curing the evil. If the tramway workers can be impressed with a proper sense of their responsibility to the public in future, and realise the self-governing power the Whitley Councils confer upon them, something may be done. On the other hand, tramway authorities may find that the Whitley Council is a rudimentary form of automatic safety valve for the ebullient outbreaks of labour, and should do all in their power to make it an efficient instrument Strikes are mere blind explosions, destructive, wasteful, and unworthy of both workers and employers. As tramway managers are too well aware, the accessibility of the tramway undertakings to labour and communal interests has been a serious hindrance to practical work, but it can be, and ought to be, a great driving force, if an organ is provided in which labour and the public can thrash out their difficulties and adjust their relative claims, leaving the management to carry through the arrangements made and the practical operations of tramway service.

NATIONAL TRAMWAY ARBITRATION.

A PERIPATETIC COURT.

The Interim Court of Arbitration under the Wages (Temporary Regulation) Acts, 1918 and 1919, after sitting at Bristol on Wednesday, September 24, on Thursday travelled to Manchester, where on Friday evidence was heard on behalf of a number of tramway undertakings. In the evening the Court proceeded to Glasgow where a sitting was held on Saturday, the case being stated there for several important undertakings. On Tuesday, September 30, the Court sat again in London, at the Royal Commissions House, continuing the evidence which there was no time to receive at the previous sitting in London. On Thursday the Court again sat in Manchester, and to-day the hearing will again be resumed in London and probably completed. The Court proposes to issue its decision as soon as possible thereafter.

Owing to the railway strike, it was necessary to make provision for conveying the Court and representatives of the parties concerned by road.

MANCHESTER TRAMWAYS EXTENSION.

The Parliamentary Committee of Manchester City Council have decided on the main provisions of the Improvements Bill they intend bringing before Parliament during the session of 1920. Among the most important items are the street widening and tramway schemes. New roads are projected from Aytoun Street, in a southerly direction, along a widened Coburg Street; another runs from the junction of Higher Cambridge Street and Coupland Street, connecting Carter and Lloyd Streets with Cambridge Street. Land is to be acquired on the basis of a provision that the capital required shall be mostly raised on the credit of the revenue of the Corporation tramways undertaking.

Powers are also sought to construct tramway terminals at St. Peter's Square, Stevenson Square, Cannon Street (Corporation Street), and Parker Street (Piccadilly), and for the making of new tramways and connections with existing lines. The principal connections to be made are: Piccadilly tramway with the Great Ancoats Street lines; Whitworth Street West to join Lloyd Street route; a double line commencing by a junction with existing tramway in Albion Street, thence proceeding in a south-easterly direction along Medlock Street, terminating at a junction with Stretford Road tramway.

A number of other lines, both double and single, are proposed, and the scheme seems well calculated to accomplish its aim of providing Manchester with a complete system of tramways.

PETROL MAXIMUM PRICES REVISED.

The Board of Trade on Thursday issued an Order revising the maximum prices of motor spirit fixed in the Order of October 1 as follows:—Spirit in cans—Aviation, 3s. per gallon; special boiling points, 2s. 11½d. per gallon; No. 1, 2s. 8d. per gallon; No. 3, 2s. 6d. per gallon. For delivery to commercial consumers (not for resale) in steel barrels 1d. per gallon less than can price, and for delivery in bulk to commercial consumers (not for resale) 1½d. less than can price. One penny per gallon to be added to all the above prices when sold for delivery in Scotland or Ireland.

The maximum price at which motor spirit may be sold by retail shall be the delivered price per gallon to the retailer, with an addition of 4½d. a gallon. Quantities less than a gallon shall be sold at a price proportionate to that charged per gallon. Where motor spirit is delivered by a retailer to a purchaser at any place other than the retailer's place of business, an extra charge at the rate of 1d. for a gallon or for any part of a gallon may be added to the price permitted by this Order.

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THE RAILWAY STRIKE.

The railway transport service of the whole country was paralysed by a strike of railway workers at midnight on Friday, September 26. The origin of the disturbance appears to be easy to trace on the surface, though causes not apparent have also been at work. In March last, an agreement between the Government and the railway workers was made which stabilised the then existing basic and war wages until the end of December, 1919. Since that agreement was made, the railwaymen have continually agitated for its alteration, alleging that an anomaly existed whereby some men in a given grade were receiving lower pay than other men in the same grade. In August, the Government conceded the principle of standardisation to engine-drivers and firemen, influenced by the plea that these men had special qualifications and great responsibilities and were therefore entitled to special consideration. As soon as this arrangement was put into operation, the other classes of railway workers began to demand that they should be placed upon a like footing. The Government, when approached by the officials of the railwaymen's union, on the subject pointed out that the agreement expressly stipulated that the whole situation was to be reviewed at the end of the year. The agitation continued, however, and finally on September 16 the President of the Board of Trade consented to receive a deputation of the men's representatives. On September 19, the Board of Trade put forward an offer to the men, conceding a large part of their demands, but based on the percentage principle and not on the principle of standardisation. It provided for an average increase of 100 per cent. on pre-war rates with a minimum of 40s. This offer the Executive Committee of the railwaymen's union refused, threatening an immediate strike if a further offer were not received from the Government by noon on Thursday, September 25. A reply was given by Sir Eric Geddes, who had then taken over control of the transport services of the country as Minister of Transport, offering to discuss the matter. On September 25 a conference was held, at which the Prime Minister was present. A long discussion ensued, in the course of which the Government further offered that no reduction in present war wages should come into effect until the price of living had fallen to 110 per cent. above the level of July, 1914, and had remained at that level for three months. The war wage had been calculated for a cost of living standing at 120 per cent. above the 1914 level, and the present level now stands at 115 per cent. The conference was adjourned until the following day, when the men's representatives, still dissatisfied, requested that they should be allowed to discuss the issue among themselves, and the Prime Minister and his colleagues retired from the conference. After a time, the men's officials intimated that their decision was made, and the Ministers returned to the room. Mr. Thomas, the secretary of the National Union of Railway Workers, stated that they had decided to refuse the Government's offer, and that an immediate strike of all the railwaymen in the country would be declared. This took effect at midnight of the some day. On Saturday morning, most of the railway services were suspended.

According to an agreement between the Transport Workers' Federation, the Miners' Federation, and the National Union of Railwaymen, known as the "Triple Alliance," the other two unions undertake to support the railwaymen in any dispute, and the question anxiously debated throughout the country was whether the agreement would take effect and bring out the whole of the transport workers. The Executive of the latter's union met on Monday, and offered by telegram to call a strike, if necessary, but both Mr. Thomas and Mr. Bromley, the secretary of the Locomotive Drivers' and Firemen's Union, deprecated such a step.

A conference of the 36 unions affiliated with the Transport Workers' Federation was summoned for Wednesday, October 1. As a result, a deputation was appointed to confer with the Prime Minister and the other Ministers concerned. The deputation received a definite reply, after repeated conferences, lasting till after midnight, in which Mr. Lloyd George made it clear that "in the opinion of the Government it would be quite impracticable to continue negotiations till work was resumed."

On Thursday, however, a deputation of the affiliated unions resumed conference with the Prime Minister, endeavouring to find a way out. Mr. Robert Williams has been active in the effort to continue the negotiations and to moderate the more bellicose leaders taking part in the deputation. He doubtless recognises that it would be an act of folly to bring out the tramway workers while their own demands are before the Arbitration Court.

A meeting of the Vehicle Workers' Union was to be held on Friday night at eleven o'clock, and the Executive were also endeavouring to arrange a series of mass meetings of tramway and bus men to decide on the question of sympathetic action with the N.U.R.

Early on Friday morning there was great activity at the headquarters of the vehicle workers.

STRIKE ITEMS.

On the morning of Monday, September 29, the situation throughout the whole country was dangerous in the extreme. Fortunately the Government were able to assure the people that adequate measures had been taken for securing the transit of food supplies. But very few trains were running, and the Underground came to a dead stop for the moment. In a few hours the management of the latter got to work, and organised a limited service with the aid of volunteer workers. On Tuesday, the service was increased, and by the end of the week all the Tubes, the District Railway and the Metropolitan were running services at intervals varying from 3½ minutes on the District Railway to 10 minutes on the Central London Tube. The benefit to the London public was very great, reducing the congestion of passenger traffic on the streets, which had become almost intolerable.

At the close of the week, the number of trains running on the different railways was as follows:—Great Western, 360; London, Brighton and South Coast, 318; Great Eastern, 263; London and North Western, 225; South Eastern and Chatham, 206; Great Northern, 58; London and South Western, 37. (Not including local services).

During the week, all the great highways of the country have become populous with vehicles of all descriptions. In the towns, motors, bicycles, cabs, horse-drawn vehicles, many of them long past ordinary service, were brought into use. A principal difficulty was created by the paralysis of the long-distance services, and here the motor came into play.

DAIMLER COMES TO HELP.

The following notice has appeared in the London press, indicating the willingness of such companies as the Daimler to help the public out:—

With the approval of the Ministry of Transport, the Daimler Hire, Ltd., are running a service of road transport for passengers between London and Birmingham. This service is to be utilised for business trips and journeys of importance in the national emergency.

Permits are issued by the Automobile Association and the Royal Automobile Club for the London to Birmingham trips, and by the Midland headquarters of the A.A., Central House, New Street, Birmingham, for the Birmingham to London journey. All London applications must be made personally at Messrs. Daimler Hire, Ltd., 26, Store Street, Tottenham Court Road, W.C. Permits will only be issued where these officials are satisfied that the journey is of sufficient urgency to justify the accommodation being allotted. The service will be extended to Liverpool, Manchester, and other centres as found necessary.

MISCELLANEOUS NEWS AND NOTES.

Illuminated Tramway Signs.—Illuminated signs are being placed on the lamp posts in the vicinity of the tramway termini in the City of London.

Stoppage of Liverpool Service.—For more than an hour on the evening of September 29 most of the Liverpool cars, on reaching the centre of the city, were stopped owing to a failure of current.

Trackless Trolley Proposed at Southend.—The Tramways Committee of Southend-on-Sea Corporation are reported to be considering the introduction of the trackless trolley on extensions of the tramway system.

Fares at Liverpool.—The Liverpool branch of the National Union of Railwaymen has sent a resolution to the Liverpool Corporation protesting against the increase in tramway fares, and adding that the members are tired of straphanging to relieve the ratepayers.

Half-Watt Lamps.—The Electric Lamp Manufacturers' Association have announced a considerable reduction in the price of half-watt type (gas filled) electric lamps. This is in continuation of their pre-war policy of reducing prices as and when improvement in manufacturing methods enable this to be done.

Morecambe's Tramway Purchase.—At a meeting held on Thursday, September 25, Morecambe Town Council confirmed the agreement with the Lancaster Tramways Company, entered into jointly with Lancaster Corporation, for the purchase of the tramway undertaking between Morecambe and Lancaster, for the sum of £8,000.

Stoppage of L.C.C. Cars.—On Wednesday morning from 10 o'clock to 10.20, all cars on the London County Council tramways were stopped, owing to some mishap at Greenwich station. The previous day, through an accident to a car at the southern end of Westminster Bridge, cars on the Embankment were stopped for some time.

Season Tickets During the Strike.—It is reported that the railway companies will compensate the holders of season tickets by extending the date of the expiration of the tickets according to the length of time the holders were unable to use them owing to the strike. This plan was pursued on the occasion of the tube strike last February, when the services were suspended for about a week.

Warrington Tramway Extensions.—Warrington Town Council, on October 23, will consider the advisability of making an application to the Board of Trade for a provisional order for tramway extensions. They propose to link the existing tracks in Butter Market Street with those in Bridge Street by a double line, and to extend the line from the latter point along Napier Street and Parr Street.

Brighton Extension Scheme Shelved.—When the minutes of Brighton Corporation Tramways Committee were submitted for adoption by the Town Council, at the recent meeting, it was moved and seconded that the proposal of the Tramways Committee to extend the tramway track to the borough boundary at a cost of £4,300 should be referred back. The motion was carried by a large majority.

Complaints Against Doncaster Tramway Track.—At a meeting of the Bentley Council considerable criticism was levelled against the Doncaster Corporation for the unsatisfactory manner in which, it was alleged, they maintained the tramway track from Doncaster to Bentley. Letters written on the subject had brought no improvement. It was resolved to report the matter to the Board of Trade, and to ask for an inspection by the Light Railway Commissioners.

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Accident at North Shields.—A serious accident occurred at North Shields on September 27, when the brakes of an electric tramcar failed to act as the car was descending Borough Road. On reaching the foot of the incline the car jumped the rails, crossed the roadway, and knocking down an electric light standard, crashed into an iron structure, then toppled over on its side. Fifteen persons were hurt, three of them very seriously. The driver, who bravely stuck to his post, escaped without injury.

The Wallasey Corporation Bill, to be promoted in the next session, has been modified by the Parliamentary Committee, all proposals involving serious expense having been removed from it, including that relating to tramway improvements. These include the purchase of frontages in various parts of the borough in order to provide double tracks in place of the existing single track. The other improvements are greatly needed, and it is felt that the present is not a suitable time to undertake street widenings.

Ipswich Saves £1,100 Per Annum.—At a recent meeting, Ipswich City Council received the report of the Electric Supply and Tramways Committee, in which a series of changes in routes and fare stages were recommended. The proposed rearrangement of the routes will, by reducing the standing time at the termini, enable the ordinary service to be operated with two less cars than now required, with a consequent saving in expense estimated at about £1,100 per annum. On the motion of the Mayor, the report was unanimously adopted.

Potteries Electric Traction.—The Stoke-on-Trent Corporation has resolved to purchase the Potteries Tramways. The consideration is £737,890, payable over thirty years in half-yearly instalments, with 5 per cent. It is interesting to examine the position. The Potteries Electric Traction Company, which is concerned in the matter, has an authorised capital of £600,000, of which £490,000 is issued in equal portions of Ordinary and Preference shares. There are also Debentures for £245,000, redeemable at 108 per cent.

Engineering Exhibition at Olympia.—The Shipping, Engineering and Marine Exhibition, opened at Olympia last week by Lord Weir, is being largely attended, although the railwaymen's strike is a serious handicap. Over 300 firms are exhibiting in the British Section and about 50 in the Dutch section. On Friday the Municipal and County Engineers paid an official visit to the exhibition, and to-day Captain W. P. Durtnall will address the Institute of Marine Engineers on "The Electrification of Ships." The exhibition will remain open until October 17.

Mexican Tramways.—The statement recently published in New York newspapers to the effect that the Mexican Government had entered into a contract with the Mexican Tramways Company for a resumption of the construction of the tramways between the City of Mexico and Puebla is denied, but it is stated that an arrangement has been made with the Mexican Government whereby the time limit for the construction of the line has been extended for a further six and a half years. As is well known, the property of the company was taken over by the Mexican Government several years ago, and the lines were operated by it until May last, when they were handed back to the company which is now working them. It is too early yet to judge whether the tramsway can be operated without loss, but the managing directors hope to be able to do this. The service has already been considerably improved.

Barrow Town Council's Tramway Purchase Scheme.—Following upon the resolution passed by Barrow Town Council to purchase the tramways of the town from the British Electric Traction Company, the Council held a special meeting, at which it was resolved that "the Tramways Undertaking Sub-Committee and the Town Clerk be and they are hereby instructed to take all necessary steps to carry the foregoing resolution into effect. And also for the purpose of adopting such other resolutions in the matter as may then be determined on by the Council." Councillor A. Brown next moved:—"That application be made to the Board of Trade for their consent to the Corporation borrowing a sum not exceeding £120,000 in respect of the purchase and development of the undertaking authorised by the Barrow-in-Furness Tramways Order 1884, 1894, and 1903." Both resolutions were adopted unanimously.

Obstruction of Tramway Lines.—Last week, obstruction of tramway lines by the drivers of other vehicles was the subject of consideration for police courts in several towns. At Leicester, the Corporation summoned a carter who had driven a horse and wagonette for about a mile and a quarter in front of a tramcar, taking no notice of the continuous sounding of a gong and the blowing of a whistle by the motorman. When asked for an explanation of his conduct, the defendant threatened to knock the motorman's head off. The Chairman of the Bench characterised it as a very bad case, and fined the obstructionist the maximum penalty of 40s. As a result of the complaints of Sheffield Corporation Tramways Committee, the police authorities summoned six different drivers of horsed vehicles for travelling on the wrong side of the road in Sheffield Road, Tinsley. At the Court, the chairman of the Bench said his experience was that in many cases horse vehicles were over-weighted. It was annoying to tram passengers to be held up because the driver of the horse "through pure cussedness" would not get off the line. "I sometimes wonder that a tram driver does not get off and take the law into his own hands." Mr. Scorah, who appeared for the defence, said the Corporation seemed to think that motor traffic was going to be the traffic of the future. It was a hardship upon the owners of horses. In the first case taken there was no obstruction, and the magistrates dismissed it. The police thereupon withdrew the other five cases.

New Light Railway in Cheshire.—An order made by the Light Railway Commissioners and confirmed by the Board of Trade, authorising the construction of a light railway in the parishes of Little Sutton and of Netherpool, Cheshire, has been issued as a white paper. The capital of the company will be £75,000 in £10 shares, and Mr. Herbert Levinstein and Sir H. D. McGowan, and two other persons nominated by them, are the first directors. The railway commences at Little Sutton Station by a junction with the joint railway of the L. & N.W. and G.W.R., and terminates in Netherpool.

Sunday Tram Service at Colwyn Bay.—During the visit of the Fleet to Colwyn Bay, the Llandudno and Colwyn Bay Electric Railway Company ran a service of tramcars on the Sunday between Llandudno and Colwyn Bay for the convenience of the naval men and their friends. At the meeting of the Colwyn Bay Town Council following, the question as to the right of the Company to do such a thing was raised, and it was pointed out that a clause in the agreement between the municipalities and the company expressly forbids Sunday running. After discusson, the motion that the Council protest was withdrawn, and the subject dropped.

PERSONAL.

Mr. J. I. Newell, electrical superintendent, British Columbia Electric Railway Company, has taken over the duties of the hydro-electric engineer, succeeding Mr. F. S. Easton, who recently resigned in order to join the Mexican Light and Power Company.

Mr. J. Makins has been appointed general manager and electrical engineer of Bexley Urban District Council tramways at a salary of £700 a year, in succession to Mr. H. P. Stokes, who recently accepted a similar position at Plymouth. Only about a year ago Mr. Makins was appointed mains superintendent of Bexley undertaking at a salary of £300.

Mr. W. Tuke Robson, who recently resigned the management of Southampton Corporation tramways, sails for America on the "Mauretania," on October 15, to study American and Canadian tramway practice. Mr. Robson will be pleased to undertake any commission or inquiry on his tour, which will include the principal tramway systems and engineering centres in the United States and Canada. Mr. Robson may be addressed, care of the TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

FINANCIAL.

Northern General Transport.—The directors of the Northern General Transport Company propose to pay on September 30 an interim dividend on the ordinary shares of 2½ per cent. (6d. per share) for the half-year ended June 30 last.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended October 1 amounted to £91,847, an increase of £24,456 as compared with the corresponding period last year. The route mileage was 141.67, the same as a year ago. From April 1 (the commencement of the financial year) to October 1 (twenty-six weeks and two days) the total receipts were £2,142,572, an increase of £426,653 on the corresponding period of 1918.

East Ham Corporation tramways show a deficit of £11,000. On the municipal electrical undertaking there is a loss of £9,000.

Shanghai Electric Construction Company announce an interim dividend at the rate of 6 per cent. (12s. per share) for the half year. A year ago the rate was 5 per cent.

CONTRACTS AND ORDERS.

Salford Tramways Committee recommend accepting the tender of Bolckow, Vaughan & Co., Ltd., Middlesbrough, for the supply and delivery of 500 tons of Sandberg silicon steel tramway rails, at the price of £19 per ton, amounting to the sum of £9,500 (exclusive of the royalty payable to Mr. Sandberg); and for the supply and delivery of 250 pairs of steel fish plates for tramway rails at the price of £25 per ton, amounting approximately to the sum of £157 10s.

Walthamstow Light Railway Committee has placed an order for 20 tons of steel tramway rails with Walter Scott, Ltd., at a price of £21 10s. per ton.

Salford Tramways Committee has accepted the tender of Hadfields, Ltd., at £573 for steel tie bars, and of W. T. Glover and Co., Ltd., at £338 10s. for light cable.

BUSINESS NOTES.

Peacock Brakes.—It may interest readers to know that the number of "Peacock" brakes manufactured and sold in the United Kingdon exceeds 9,600. Owing to the great difficulty for months past in obtaining a sufficient quantity of malleable iron castings, late deliveries have been inevitable. The Peacock Brake Company is doing its best to meet the situation, and they suggest that every intending buyer of "Peacock" brakes or parts should order as far in advance of their requirements as possible. Mr. J. Mc I. Cater informs us that the postal address of the company is now 43, Kensington High Street, London, W.8. Telephone number, "Western 355"; telegraphic address, "Inbrake, Kens, London."

Messrs. Dunford and Elliott (Sheffield), Ltd., steel manufacturers, have opened their own offices in London at 4, Copthall Buildings, Copthall Avenue, E.C.2. The general management of the London office is in the hands of Mr. Ivor S. Winby, who has hitherto controlled Messrs. Dunford and Elliott's export business, whilst the services of their London agent, Mr. E. St. Clair Duncan, are retained in the capacity of sales manager.

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PRICE LIST OF TRAMWAY AND OMNIBUS SHARES.

Dividends Prev.	Dividends Last.	Name.	Paid.	Price, July 27, 1914.	Cash Oct. 2 or previous.	A week ago.
5%	5%	Alabama Traction 5% 1st Mt. ..	—	67	63	62½
2/6	2/6	Anglo-Argentine 5½% 1st Pref.	5	4½	62/6	62/6
2/9	2/9	Do. 5½% Cum. 2nd Pref. ..	5	4½	50/-	50/-
4%	4%	Do. 4% Deb.	100	91	66½	67½
4½%	4½%	Do. 4½% Deb.	100	98½	68	68/-
5%	5%	Do. 5% Deb.	100	96	63½	63½
—	—	Associated Omnibus Co. Ord. ..	5/-	⅜	1/2	1/2
1/-	6d.	Auckland Elec. Trams. Ord. ..	1	1⅛	20/3	20/S
5%	5%	Do. 5% 1st Mt. Deb. ..	100	102½	90½	90½
7%	7%	Barcelona Trac. 7% Pr. Lien ..	100	—	102½	102½
—	1/-	Bath Electric Trams Pref. Ord.	1	½	4/1½	4/1½
6d.	6d.	Do. 5% Cum. Pref. ..	1	⅝	11/6	11/6
4½%	4½%	Do. 4½% 1st. Mort. Deb. ..	100	72½	68	68
4½%	4½%	Birmingham Dist. Pwr. and Tract. Co. 4½% 1st Deb. ..	100	84½	72½	72½
16/-*	18/-*	Bombay Elec. Sup. & Tram Ord.	10	14	60	60
6/-	6/-	Do. 6% Cum. Pref. ..	10	11½	12½	12½
4½%	4½%	Do. 4½% Deb.	100	96	77	77
5%	5%	Do. 5% 2nd Mt. Deb. ..	100	100	87	87
$1	$1	Brazilian Trac. & Power Ord. ..	$100	66	58½	57½
$1½	$1½	Do. 6% Cum. Pref. ..	$100	97	91½	93½
4/-	4/-	Brisbane Elec. Trams. Ord. ..	5	7½	100	100
2/6	2/6	Do. 5% Cum. Pref. ..	5	5	76/3	76/3
4½%	4½%	Do. 4½% 1st Deb.	100	101½	93½	93½
3%	3%	Brit. Col. Elec. Ry. Def. Ord. ..	100	107	38½	39
5%	5%	Do. Pref. Ord.	100	106	47	47
5%	5%	Do. 5% Cum. Pref. ..	100	108	56½	56½
4½%	4½%	Do. 4½% 1st Mt. Debs. ..	40	99½	85½	85½
4½%	4½%	Do. 4½% Perp. Con. Deb.	100	96½	56	55½
£8*	£8*	Brit. Elec. Trac. Ord.	100	—	40½	40½
6%	6%	Do. 6% Cum. Part. Pref.	100	—	75½	75½
5%	5%	Do. 5% Deb.	100	92	82½	84
4½%	4½%	Do. 4½% 2nd Deb. ..	100	77½	67	66½
5%	5%	B. A. Lacroze 5% Mt. Deb. ..	100	100	82½	83
2/6	6/6	Calcutta Tramways Ord. ..	5	7½	8½	8½
2/6	2/6	Do. 5% Cum. Pref. ..	5	5⅛	78/9	78/9
4½%	4½%	Do. 4½% 1st Deb. ..	100	99½	69½	69½
1/-*	1/-*	Cape Elec. Trams.	1	⅛	13/-	13/-
1/3	1/3	City of B. A. Trams	5	5½	80/-	80/-
4%	4%	Do. 4% Deb.	100	97½	70	70
5%	5%	Colombo Elec. Tram. & Ltg. Co. 5% 1st Mort. Deb.	100	95	77	77
5%	5%	Co. F.C. do. Jardin Botanico 5% 1st Mort. Bds.	100	98½	84	84
5%	5%	Costa Rica Elec. Lt. & Trac. Co. 5% 1st Deb.	—	63½	47½	47½
4/-	7/-	Dublin United Trams. Ord. ..	10	8	7½	7½
6%	6%	Do. 6% Pref.	100	—	105	105
—	—	Hastings & Dis. Elec. Tram Ord.	10/-	½	1/9	1/9
1/2½*	1/2½*	Do. 6% Cum. Pref. ..	1	⅝	11/1½	11/1½
4½%	4½%	Do. 4½% Deb.	100	67½	60½	59½
10d.	9d.	Hong Kong Tramway	5/-	⅝	26/3	26/3
5%	5%	Do. 5% Deb.	100	87½	—	—
3/6	3/-	Isle of Thanet 5% Pref. ..	5	2½	35/7½	32/3
4%	4%	Do. 4% Deb.	100	73½	50	50
—	3%	Kalgoorlie Trams 6% B. Deb. ..	100	15	16	16
—	—	La Plata Trams. Ord.	1	⅛	2/-	2/-
11/-	7/-	Lanarkshire Trams Co. ..	10	10½	£12	12½
5%	5%	Lancs. Un. Trams 5% Pr. Ln.	100	85½	67½	76½
5%	5%	Lisbon Elec. Trams 5% Mt. Debs.	100	95	17/-	67½
7½d.*	10½d.*	Llandudno & Colwyn B. Ord.	1	—	14/2½	14/2½
—	1½d.	London & Sub. Traction Ord. ..	1	⅛	2/3	2/4½
6d.	6d.	Do. 5% Pref.	1	⅛	5/4½	5/6
4½%	4½%	Do. 4½% 1 Mt. Deb. ..	100	75½	55	55
4½%	4½%	L.G.O. 4½% 1st Deb.	100	100	80	80
5%	5%	Do. 5% Inc. Deb.	100	88½	75	74
41/7½	41/7½	Lon. Unt. Trams. 4% 1st Mt. Db.	100	55	45	46
3/-	3/-	Madras Elec. 6% Pref. ..	5	5⅛	81/10½	81/10½
5%	5%	Do. 5% Deb.	100	100	86½	86½
7½d.%*	9½d.*	Manaos Trams & Ltg. Ord. ..	1	⅝	4/6	4/6
5%	5%	Do. 5% 1st Deb.	100	77	65½	65½
$1½	$1½	Manila Elec. R. R. & Light ..	$100	102	77½	77½
4½%	4½%	Met. Elec. Trams. 4½% Deb. ..	100	85½	71	71
5%	5%	Do. 5% Deb.	100	87	75	75
$1½	$1½	Mexico Trams. Common ..	$100	70	35	35½
5%	5%	Do. 1 Mt. 5% G.B. ..	—	84	53	53
—	—	Do. 6% Mt. Bds. ..	100	76	41	45
4½%	4½%	Montreal Trys. Co. 4½% Stg. Dbs.	100	100	94½	93½
4½%	4½%	Do. 4½% Stg. Debs. (1922)	100	99	95	95
2/-	1/2½*	National Steam Car	1	⅛	19/-	18/6
9½d.*	9½d.*	New General Traction	1	⅛	8/3	8/3
6d.	1/1½.	Northern Gen. Trans. Ord. ..	1	⅛	20/-	20/-
3/-	4/-	Para Elec. Rlys. Ord.	5	4½	75/-	72/6
5%	5%	Do. 5% 1st Deb.	100	89½	75	74½
—	—	Pernambuco Tram. & Power Ord	1	—	5/-	5/-
8½d.	8½d.	Do. 7% Non. Cm. Part Pf.	1	—	14/-	14/-
5%	5%	Portland Ry. 5% 1st Mt. 30 yr.	—	96	76	76
8½d.*	1/-	Potteries Elec. Trac. Ord. ..	1	⅛	12/9	11/6
6d.	6d.	Do. 5% Pref.	1	⅛	12/9	12/4½
1/4	8d.	Provincial Trams. Ord. ..	1	⅛	18/4½	18/4½
3/-	3/-	Rangoon Tram. 6% Cum. Pref.	5	5½	80/-	77/6
5%	5%	Rhondda Trams. 5% 1 M. Deb.	100	88	82½	82½
5+	5%	Rio de Janeiro Try. & Pr. 1st Mt. 30 yr. 5% Gld. Bd. '35 ..	—	97½	89½	91
5%	5%	Do. 1st Mt. 5% 50 yr. ..	100	89½	80½	80½
5%	5%	Sao Paulo Deb. 5% 1st Mt. ..	$500	99	92	92½
5%	5%	Do. 5% Perp. Deb. ..	100	99½	77½	76½
10/-	20/-	Shanghai Elec. Cons.	10	13	19	19
2d.	8d.	Singapore Elec. Trams. ..	5/-	¼	3/6	3/6
4%	4%	Sou. Met. Elec. Tram & Ltg. 4% Db	100	66	56½	56½
5%	5%	S. Elec. Trams. of B.A. 5% Mt. ..	—	100½	99½	99½
4½%	4½%	Toronto 1st Mt. 4½% Bds. ..	100	98	92½	92½
4½%	4½%	Tramways (M.E.T.) Omnibus 4½% Debs.	100	91	75	75
2/-	2/-	Un'd. El. Tr. Monte Video Ord.	5	4½	45 -	40/7½
4½%	4½%	Winnipeg El. 4½% Deb. ..	100	94½	65½	65½
—	—	Yorks (W.R.) Elec. Trams. Ord.	5	⅛	25/10½	25/10½
3/-	3/-	Do. 6% Cum. Pref. ..	5	⅛	75/6	75/6
4½%	4½%	Do. 4½% 1st Deb	100	85½	70	70
—	—	Metropolitan Dist. Ord. ..	100	21½	22	21½
—	—	Undgd. Elec. Rys. of London ..	10	21½	60/7½	58/9
		Do. "A"	1/-	⅛	8/3	8/4½
4½%	4½%	Do. 4½% Bds. of 1933 Rd.	—	99	10 1	100½
6%	6%	Do. 6% 1st. Cum. In. Db.	100	114	97½	99
%	4%	Do. 6% In. Bonds Rd. ..	—	86	92½	93½

* Indicates dividend for the year. In other cases the dividend is for the half-year.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

Names.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C. ..	Sept. 16	568	587	+ 19	24	12,671	+ 542
Aberdeen Corporation ..	,, 17	2,664	3,475	+ 811	15½	55,693	+ 12,518
Ayr Corporation ..	,, 17	529	645	+ 116	19	17,979	+ 3,426
Belfast City	,, 26	8,882	10,254	+ 1,372	26	268,896	+ 62,103
Birkenhead Corporation	,, 28	2,852	2,985	+ 633	25½	71,881	+ 13,810
Birmingham Corporation	,, 20	24,576	25,420	+ 841	25	639,424	+ 55,405
do. Motor Buses	,, 20	1,403	1,634	+ 231	25	44,033	+ 5,623
Blackburn Corporation ..	,, 24	1,827	2,085	+ 258	26½	63,081	+ 13,784
Bradford Corporation ..	,, 20	9,600	11,398	+ 1,798	25	286,921	+ 55,764
Burnley Corporation ..	,, 27	2,426	3,232	+ 806	..	..	..
Burton-on-Trent Cor. ..	,, 28	413	529	+ 116	26	13,153	+ 2,330
Bury Corporation ..	,, 28	2,683	2,571	+ 488	25½	63,595	+ 8,762
Chatham & District ..	,, 18	1,254	1,703	+ 249	37	57,338	+ 8,068
Cork Electric	,, 11	680	979	+ 299	36	24,721	+ 1 613
Derby Corporation ..	,, 27	1,513	2,021	+ 508	26	50,881	+ 11,115
Dundee City	,, 17	1,962	2,627	+ 665	17½	46,692	+ 11,288
East Ham Corporation ..	,, 17	1,725	2,003	+ 278	25½	49,992	+ 9,668
Edinburgh	,, 20	8,238	11,229	+ 2,991	11½	140,829	+ 28,329
Glasgow Corporation ..	,, 27	29,254	33,553	+ 4,299	17	547,849	+ 57,790
Glossop (U.E. Sup. Co.) ..	,, 27	176	245	+ 69	39	8,726	+ 1,629
Huddersfield Corporation	,, 20	3,872	4,769	+ 897	25	123,911	+ 26,610
Ilford U.D. Council ..	,, 27	1,075	1,109	+ 184	25½	31,764	+ 5,369
Ipswich Corporation ..	,, 27	804	964	+ 160	26	25,540	+ 4,334
Isle of Thanet	,, 24	497	1,572	+ 1,075	51½	48,771	+ 32,438
Kilmarnock Corporation	,, 20	276	294	+ 18	18½	5,360	+ 688
Lanarkshire	,, 18	3,804	4,268	+ 464	37	134,688	+ 325
Leeds City	,, 20	14,097	16,508	+ 2,411	25	419,986	+ 89,160
Leicester Corporation ..	,, 27	4,775	6,046	+ 1,271	..	..	..
Leyton U.D Council ..	,, 25	2,580	2,991	+ 411	26	82,409	+ 22,301
Liverpool Corporation ..	,, 20	18,889	24,251	+ 5,362	37½	823,245	+ 144 084
London County Council ..	Oct. 1	67,391	91,847	+ 24,456	26½	2,142,572	+ 426,653
Maidstone Corporation ..	Sept. 26	293	433	+ 140	25½	10,357	+ 2,778
Manchester Corporation	,, 20	26,698	30,530	+ 3,832	25	763,886	+ 124,922
Newcastle-on-Tyne Cor.	,, 20	9,231	9,204	— 27	23	238,439	+ 11,107
Northampton Cor.	,, 19	862	1,297	+ 435	25	32,211	+ 10, 53
Nottingham Corporation	,, 25	5,723	7,225	+ 1,502	26	185,063	+ 34,196
Oldham Corporation ..	,, 28	3,379	4,745	+ 1,366	27	122,649	+ 25,506
Reading Corporation ..	,, 25	1,415	1,606	+ 191	25½	41,406	+ 7,278
Rotherham Corporation	,, 3	2,584	2,031	— 553	22½	42,930	— 2,355
Sheffield Corporation ..	,, 28	13,798	16,860	+ 3,062	26½	439,343	+ 78,214
Southampton Cor. ..	,, 17	2,708	2,790	+ 82	24½	68,684	+ 4,350
Southend-on-Sea Cor. ..	,, 24	1,468	2,312	+ 849	27	64,906	+ 26,555
South Shields Cor. ..	,, 13	1,168	1,531	+ 363	24	34,485	+ 6,809
Sunderland Corporation..	,, 28	2,052	2,791	+ 639	26	77,057	+ 21,871
Torquay Tramways ..	Aug. 14	1,700	2,019	+ 319	32	34,385	+ 6,037
Tyneside Trys. & Trmrds.	Sept. 10	1,093	1,335	+ 242	11	13,145	+ 627
Wallasey Corporation ..	,, 27	2,799	2,420	+ 621	25½	69,482	+ 17,924
Walsall Corporation ..	,, 20	1,165	1,622	+ 457	25	35,673	+ 4,751
Walthamstow U.D. Coun.	,, 27	1,476	1,713	+ 237	26	46,622	+ 7,928
Warrington Corporation	,, 25	869	924	+ 115	25	22 663	+ 3,426
West Ham Corporation	,, 25	4,984	5,150	+ 166	25½	138,518	+ 21,725
Wolverhampton	,, 24	1,714	2,126	+ 412	25	51,545	+ 7,448

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

Name.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Sept. 23	£60,741	£61,846	38	£2,161,429	+ £48,508
Ballarat and Bendigo (4 wks)	July 20	2,948	2,951	16	13,799	+ 324
Brazilian Traction (Mlrs.)	July	9,465,000	10,070,000	30	64,033,000	+ 4,875,000
Brisbane	Aug.	42,670	42,245	34	304,400	+ 13,946
British Columbia .. $	July	413,968	642,090	4	642,090	+ 228,122
Buenos Aires Lacroze ..	Aug.	41,817	46,848	8	92,068	+ 9,106
Burmah Tram. & Light Rs.	Aug. 31	41,855	43,683	4	43,683	+ 1,828
Calcutta .. .. Rs.	Sept. 20	73,915	93,591	38½	..	+ 486 0.5
Carthagena and Herrerias	Aug.	2,729	2,991	34	23,965	— 11,887
Cordoba	Feb.	12,972	13,549	48	159,208	+ 11,492
East India	Aug.	1,975	2,761	4	2,761	+ 786
Hong Kong .. .. $	Aug. 16	13,543	15,278	53	486,625	+ 38,407
Kalgoorlie	May	2,767	2,726	22	13,196	— 42
La Plata	July	6,721	5,317	31	32,774	+ 2,840
Lima	July	45,964	49,025	30	331,932	+ 29,742
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras Rs.	Sept. 15	35,470	51,193	36	699,455	+ 8,679
Manila .. .. $	June	183,250	160,670	26	1,207,412	+ 170,313
Montevideo	July	31,684	34,139	39	334,076	+ 33,551
Para	July	24,398	24,659	34	196,736	+ 2,802
Pernambuco	Sept. 21	4,322	6,196	37½	193,828	+ 25,518
Peruvian .. .. $	July	987,300	1,058,730	..	..	..
Rangoon	Aug.	5,760	6,472	34	51,660	+ 2,147
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore .. .. $	Aug. 9	15,157	15,601	32	488,896	+ 51,273
Toronto .. .. $	July	1,049,936	977,262	30	7,110,558	— 295,547
Winnipeg .. .. $	July	288,155	337,978	30	2,212,618	+ 113,125

CARS, MOTORS, CONTROLLERS.
(DICK, KERR SYSTEM.)
THE
ENGLISH ELECTRIC COMPANY LIMITED,
Queen's House, Kingsway,
LONDON, W.C.2.

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THE
Tramway AND Railway World

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SATURDAY, OCTOBER 11, 1919.

BASIC TRAMWAY FINANCE.

The award of the Arbitration Court upon the application of the National Transport Federation, the text of which appears in another column, grants a permanent increase of four shillings per week on the wages of every adult tramway employee. Argument upon the justice or wisdom of the award is futile. Unless the tramway workers refuse to accept the concession as final, and resume agitation, tramway authorities may settle down to the problem of making ends meet with that additional liability on their shoulders. It is extremely unfortunate that the arbitration proceedings were so desperately hurried and conducted with so much privacy. Even so, the British public have begun to perceive the real nature of tramway finance, and to appreciate the labours of those who are carrying on an indispensable public service with resources quite inadequate and continually subject to reduction. This process of enlightenment has been greatly aided by the fact that the greater number of tramway undertakings are municipally owned. When a municipal tramway undertaking fails to balance expenditure with income, the ratepayers have to meet the deficit. Certain towns are already being taxed at the rate of 5d. in the £ to pay for the loss incurred on the local tramways, and the financial position of several municipal undertakings is verging perilously close on actual insolvency. There is no mystery here, no secret leakages of finance, no hidden extravagance. The prices paid for materials are determined by open competition, the accepted tenders are published, and balance sheets are issued yearly. Expenditure on a municipal tramway undertaking is laid out on repayment of capital and interest, materials for renewing, repairing and operating the system, and wages. Income must be derived from passenger fares, or in the last resort local rates. Evasion of any of those factors in the equation is impossible. If interest is not paid on capital expenditure, ratepayers will cease to authorise the provision of tramways ; if the plant and equipment are not renewed, the system will soon cease to be workable ; yet the workers must be paid adequate wages. But the owners of a tramway undertaking are entitled to demand that capital shall not be wasted in useless expenditure, that the plant shall be utilised to the utmost, and that wages shall be neither extravagant nor paid for inefficient labour. In the case of company-owned tramway undertakings, the alternative is clearer and sterner. If the workers demand increases in wages the enterprise will not bear, and if passengers refuse to pay the increases in fares necessary to keep the service going, the company will naturally try to get rid of the undertaking with as little loss as possible. The question which tramway users and the municipal owners have to determine is whether or not the tramway service is worth its cost. It is at this bar the claims of tramway labour must ultimately be tried. Hitherto, tramway management has had to bear the brunt of public criticism, but by its claims to an increasingly preponderant share of the tramway revenue labour has put itself in the forefront, so that, in future, when the value of tramway service is under consideration the amount paid to labour and the return it gives will be subject d by the public, which pays, to a deeply interested scrutiny.

NATIONAL AWARD TO TRAMWAY EMPLOYEES.

The award of the Interim Court of Arbitration under the Wages (Temporary Regulation) Acts, 1918 and 1919, on the application of the National Transport Workers' Federation for an increase of 12s. a week for tramway and omnibus workers in London and the Provinces was issued on Tuesday. It grants an immediate increase of 4s. a week to employees over 18, and 2s. to those under 18. The text of the award is given below. It will throw a heavy burden on the tramway undertakings throughout the country, some of which are already approaching a condition of insolvency. In fact, a number of municipal undertakings are already receiving subsidies from the rates. Interviewed on the issue of the award, Mr. J. A. Beckett, general secretary of the Municipal Tramways Association, stated that the award would cost municipal tramway undertakings over £700,000 a year, in addition to the cost of grants already made. The effect will vary, of course, on the different undertakings. In the case of Birmingham Corporation, for instance the increase in the wages bill will amount to £35,000 per annum. The wages of the employees will be as follows :—

	Pre-war wages.	Increases since.	Present Total.
Motormen (minimum)	30/-	34/-	64/-
,, (maximum)	36/-	34/-	70/-
Conductors (minimum)	26/6	34/-	60/6
,, (maximum)	33/-	34/-	67/-

Councillor Richard Mayne, Chairman of the Newcastle Tramways Committee, referring to the award, said : "We have been sailing very nearly between receipts and expenditure, and the probability is that the fares will have to be increased."

There is considerable dissatisfaction on the part of the tramway employees with the award. It was hoped that it would have been made retrospective and that a larger increase in the wages would have been granted. The men maintain that the present award, including the addition, is not sufficient to enable them to meet the cost of living. It is reported, however, that the leaders propose to issue a statement to the whole of the unions concerned, urging them to accept the result of the arbitration and to prepare for the reopening of the question at a later date, instead of risking the loss of public sympathy by a strike against the award.

AWARD OF THE COURT OF ARBITRATION.

TRAMWAY AND MOTOR OMNIBUS WORKERS.

1. The parties to this reference are (1) the Conference of Tramway and Light Railway Companies, the Municipal Tramways Association, Dover Corporation, Ipswich Corporation, Colchester Corporation, the London General Omnibus Company, the British Automobile Traction Company, Ltd. (London Undertakings), the National Steam Car Company, Ltd. (London Undertakings), and Messrs. Thomas Tilling, Ltd. (London Undertakings), and (2) the National Transport Workers' Federation and its affiliated Unions providing for tramway and omnibus workers.

2. The claim submitted by the National Transport Workers' Federation on behalf of their members employed by the tramways and other undertakings enumerated in Schedule A annexed hereto was as follows :—

> "That for the rates in operation for the several classes of workpeople as shown in Schedule B annexed hereto there should be substituted rates of 12s. per week in excess of the said rates in the case of employees of 18 years and over, and of 6s. per week in excess of the said rates in the case of employees under 18 years of age."

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3. The matter was referred under the Wages (Temporary Regulation) Act, 1918, by the Ministry of Labour to the Court of Arbitration for settlement.

4. After a preliminary hearing on Monday, 15th September, 1919, to consider procedure, the Court decided to sit successively in London, Bristol, Manchester and Glasgow where evidence with respect to the various districts could be submitted. Representatives of the parties were accordingly heard in these four centres on 23rd, 24th, 26th, 27th and 30th September, 2nd and 4th October, 1919.

5. The position of the workpeople in many undertakings is affected by previous awards of the Committee on Production and the Court of Arbitration. Apart from awards confined to individual undertakings, the last award determining war advances was No. 2896 of the Committee on Production of 21st November, 1918, which, in respect of a number of undertakings, provided that the advances over pre-war rates should be 30s. a week in the case of men 21 years of age and over and women under an agreement to draw men's wages. The award also provided for an advance to other women of 5s. a week, subject to a maximum of 30s. over pre-war rates, and for an advance of 25s. over pre-war rates in the case of men 18 years and under 21 years of age.

6. By an agreement dated 20th March, 1919, between the Municipal Tramways Conference and the Tramways and Light Railways Association and the National Transport Workers' Federation the working week was reduced to one of 48 hours, inclusive of signing on and signing off, the wages paid for the reduced working week being equal to those received for the number of hours previously worked up to a maximum of 57 hours.

7. During the course of the hearing the Court had submitted to them details of the financial position of many undertakings.

8. The Court have given careful consideration to the evidence and to the arguments addressed to them on behalf of all parties, and their award is that the additional war bonuses or war advances now being paid to the workpeople concerned who are members of the National Transport Workers' Federation and its affiliated Unions providing for tramway and omnibus workers in the employment of the several undertakings in the respective districts set out in Schedule A annexed hereto, shall be increased by 4s. a week in the case of those 18 years of age and over, and 2s. a week in the case of those under 18 years of age.

9. This award shall not apply in those cases in which it has been the practice to regulate the wages of those workpeople concerned by movements in the wages of workpeople of a similar class employed in trades or industries other than tramway and motor omnibus undertakings.

10. In the case of the London General Omnibus Company, the British Automobile Traction Company, Ltd., the National Steam Car Company, Ltd., and Messrs. Thomas Tilling, Ltd., the award shall apply only to those grades of employees with respect to whom there are agreements between the Companies and the London and Provincial Union of Licensed Vehicle Workers.

11. The rates of pay in force under the Wages (Temporary Regulation) Acts, 1918 and 1919, for the classes of workpeople concerned in the several districts, as modified by this award shall be the substituted rates of wages of the workpeople concerned for the purpose of such Acts.

12. This award shall take effect from the beginning of the first pay period following 1st October, 1919.

WILLIAM W. MACKENZIE.
JOHN M. DENNY.
F. S. BUTTON.

G. T. REID, Secretary.
5, Old Palace Yard, S.W.1.
7th October, 1919.

SCHEDULE B.—GRADES OF WORKPEOPLE.

Drivers and Motormen, Conductors, Motor Inspectors, Ticket Inspectors, Timekeepers, Traffic Regulators, Pointsmen, Signallers, Plough Shifters, Trailer Assistants, Club-room Stewards, Stop-sign Washers, Destination Board Turners, Controller Handle Men, Brakesmen, Breakdown Hands, Assistant Ticket Vanmen, Gatemen, Station Cleaners, Watchmen, Porters, Messroom Attendants, Car Cleaners, Handymen, Labourers, Washers, Overhead Wiremen, Wiremen's Assistants, Greasers, Storekeepers, Traffic Clerks, Overhaulers, Repairers, Controller Examiners, Trolley-head Examiners, Sanders, Permanent-way Men, Cable Hands.

CONTROL OF LONDON TRAFFIC.

ADVISORY COMMITTEE TO BE APPOINTED.

Sir Eric Geddes, Minister of Transport, has asked Mr. Kennedy Jones, M.P., to become Chairman of an Inter-Departmental Committee which is to take in hand at once the control and regulation of London surface traffic, more especially with respect to the speed of vehicles, and stopping places for public conveyances.

It is stated that the Committee will consist of some seven members, among whom the Ministry of Transport, the Home Office, the County Council, and the City Corporation will be represented, while there will be Advisory Sub-Committees, on which the Extra-Metropolitan Municipal Bodies and Traffic Organisations will be represented. Any such Committee will possess the fullest powers under the Defence of the Realm Act.

L.C.C. TRAMWAY MATTERS.

IMPORTANT PROPOSALS.

The London County Council, on Tuesday, October 7th, resumed to its fortnightly sittings after the Summer recess.

Several important reports from the Highways Committee were considered. Recommendations of the Committee on questions affecting the financial position of the tramways undertaking, the veto of local authorities, and extensions of the tramway system, had been postponed from the Council's last sitting on July 19th. Since then the House of Commons Select Committee on London Traffic has done its work and issued a report, and other events have occurred which have modified to some degree the situation.

UNFAIR CHARGES ON THE TRAMWAYS.

The Highways Committee had formerly suggested that the tramways undertaking should be relieved of charges in respect of street improvements along tramway routes, rates on tracks, and war service allowances, and that the period for the repayment of loans should be extended beyond 25 years. Though presenting very strong reasons for altering the method of assessing the tramways for rating purposes, for changing the incidence of war allowances, and for extending the period allowed for repayment of loans, the Highways Committee only submitted the following recommendations:—That application be made to Parliament in the session of 1920 for the Council to be relieved of liability for the maintenance of the surface of the roadway in thoroughfares in which tramways are worked or may hereafter be worked, with the exception of any rails or other works which may be used for the purposes of the tramways; and that no part of the cost of street improvements be charged to the tramways account, except in the case of improvements which are solely and specifically required for the working of the tramway system.

The Improvements Committee, supported by the Finance Committee, recommended a joint conference between all three committees.

Lord Percy moved, and Mr. St. John Morrow seconded, that consideration of the report be adjourned until the proposed conference had reported.

On a division this was carried by 62 votes to 49.

LOCAL VETO—PROPOSED SPECIAL AUTHORITY.

To a former meeting of the Council, the Highways Committee had submitted recommendations with a view to obviating the difficulties arising from the manner in which the local and road authorities hitherto exercised the power of veto conferred upon them under standing order of Parliament, No, 22, upon the introduction of Bills to authorise new tramways. Since that time, however, the Select Committee appointed by Government to investigate the congestion in the existing means of transport within the metropolitan area, together with the question of fares, had issued its report. In view of this, the Highways Committee recommended to the Council as follows:—(*a*) That the Government be asked to set up forthwith an independent body to consider the full scheme of tramway development projected by the Council, and to hear any objections that may be raised to such scheme by the local authorities, and that such body be empowered to make such modifications in the scheme as they may think fit after hearing the evidence submitted to them by those concerned; (*b*) That it be referred to the Parliamentary Committee to take the necessary steps to obtain the suspension of the Standing Orders of Parliament so as to provide in respect of tramway schemes to be introduced in the session of 1920 that the Council shall be enabled to place such schemes before Parliament for consideration, notwithstanding the fact that it may not have secured all the requisite consents of the local and road authorities under standing orders to the introduction of the necessary Bill; (*c*) That the Minister of Transport be asked to receive a deputation from the Council in support of the proposals contained in the foregoing resolutions.

Mr. G. H. Hume defended the proposals as being the means to meet a special urgency, and pointed out that the London Tramway problem was a very serious one.

ESTABLISHMENT OF OMNIBUS SERVICES.

The Highways Committee submitted the following recommendation with a view to the establishment of omnibus services by the Council:—"That notice be given by public advertisement of the intention of the Council to consider at its meeting on 21st October a proposal that it shall take the necessary measures for promoting in the session of Parliament of 1920 legislation to enable the Council to own omnibuses, and to run in, and in the vicinity of, the County of London auxiliary omnibus services for the linking up of tramway dead-ends and for other specific purposes, and to defray out of the county fund the cost and expenses of so doing."

After discussion, it was agreed that the matter be considered at a meeting of the Council to be held on October 21st.

NEW TRAMWAY ESTIMATES.

Having been instructed to accept tenders for the authorised tramway between Lee Green and Eltham, the Highways Committee reported that they had accepted the offer of Messrs. Dick, Kerr & Co., Ltd., to construct the tramway for the sum of £83,461, which amounts to £11,500 more than the estimate. The additional cost is due to the increased costs of labour and material since the date of the estimate, and the Committee therefore recommended that the supplemental estimate be approved. A supplemental estimate, amounting to £5,520 having been rendered necessary by

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similar causes for the authorised tramways in High Street, Wandsworth and East Hill, it was recommended that the estimate be approved. A number of other reports of minor importance were also submitted.

MISCELLANEOUS NEWS AND NOTES.

Trackless Construction at York.—At a recent meeting, York City Council agreed to the proposal of the Tramways Committee that an overhead line for a trackless trolley service to Heworth should be constructed.

Proposed Tramways in Canton.—A syndicate, constituted by two British subjects and one Chinese, has been granted a concession for the construction of a tramway system in the city of Canton, China.

Threatened Strike in Dublin.—Owing to reductions in the service, the Dublin United Tramways Company have announced their intention of dismissing a number of the staff. The tramway employees threaten to strike if this arrangement is carried out.

Tramways Preferred at York.—A deputation of the ratepayers in the Burton stonelaying area entered a protest at the York City Council meeting against the electric omnibus service, and suggested an extension of the tramway service or the use of railless traction.

Contact System Abandoned at Lincoln.—The G.B. surface contact system, which has been in service for some years, is now being replaced by the overhead system. The Electricity Works Committee are preparing a scheme of motor transport for parts of the city not served by the tramways.

Railless Routes at Nelson.—Nelson Town Council has appointed a sub-committee to consider the question of providing facilities for the conveyance of persons to certain portions of the town not served by the present tramway system. It is understood that railless traction will be proposed.

Proposed Extension of Huddersfield Tramways.—A special meeting of Brighouse Town Council considered the question of giving sanction to the proposal of the Huddersfield Corporation to construct a system of tramways from that borough through Rastrick, to the centre of Brighouse, where they would connect with the Halifax system, and, via Bailiffe Bridge, with the Bradford service. After discussion, the proposals of Huddersfield Corporation were unanimously accepted.

London Transport Committee's Report.—The report of the Select Committee on Transport (Metropolitan area) together with the proceedings of the Committee, minutes of evidence and appendices, have now been issued in a Blue Book. The volume comprises 446 pages and is issued by H.M. Stationery Office, price 4s. The recommendation of the Committee for urging the immediate creation by Parliament of a London Traffic Authority were given in our issue of August 14, and a summary of the evidence appeared in the issue of September 11.

London Carman Awarded Damages.—In an action brought against the London County Council at Shoreditch County Court a carman was awarded £22 14s. for damages to his horse and van. It was stated that there was a 14ft. stretch of track with a depression of half-an-inch to an inch, and owing to this the van skidded and was thrown against a motor lorry. For the Council it was admitted that the track was in bad condition, although not so bad as was stated. Defective tracks were being put in order as quickly as could be done in the face of difficulties.

Fares in Liverpool.—It has been complained that the readjustment of fares and stages on Liverpool Corporation Tramways bears unfairly upon the working-class population. In reply to a motion put forward at Liverpool City Council meeting, Alderman Russell-Taylor said the fares and stages were at present in a transitory state. There were parallel routes on which different fares were being charged, as the new fares had not yet been introduced all round. He undertook to bring the motion before the committee. On this understanding the motion was dropped.

Landowner Proposes Light Railway.—It is something of a novelty to find a landowner not only proposing that a light railway should be run through his estate, but also undertaking to construct it if sufficient support is forthcoming. This was the purport of a letter addressed by Sir Robert Walker, of Sand Hutton Hall, to the Derwent District Farmers' Club. He proposes that a light railway of 18-inch gauge be constructed from the vicinity of Warthill Station to Bossall and over the Derwent to Scrayingham. The meeting held the matter over for consideration at a larger assembly.

Car Overturned at Burton-on-Trent.—On Wednesday as a Burton and Ashby Light Railway car was mounting Bearwood Hill Road, the steepest gradient in Burton, it suddenly commenced to run backward. The driver put on the brakes and the conductress applied the sand, but the car running down at an increasing speed left the rails at the bottom and fell on its side within a few yards of the River Trent. Both the driver and the conductress stuck to their posts and the latter was very seriously injured. A woman passenger was killed and about twenty passengers were injured. Mr. J. Toulmin, the general manager of the Burton and Ashby Light Railways, said he was unable to account for the disaster. The same car had made the journey up and down the hill on the same day and the brakes had received the attention and inspection of the shed staff. He paid a warm tribute to the courage of the conductress, Miss Lilian Parker, and said that she carried out her emergency instructions to the letter, while the driver, Charles Insley, did everything that was possible. Apparently the brakes failed to act.

Track and Car Renewals at Bournemouth.—The Corporation have decided to re-lay a portion of the tramway lines, at an estimated cost of £184,000, and to purchase new cars at a cost of £60,000. A proposal to institute motor-buses instead of trams has not been favourably received.

St. Helens Municipal Tramways.—The municipalised tramways of St. Helens began operations on Wednesday, October 1, under the management of Mr. L. C. Bellamy, who was appointed to the position some months ago. The undertaking has a route length of about 18.5 miles. At the recent meeting of St. Helens Town Council, Councillor Rudd said that track and equipment was going to cost £73,000, old tram cars £24,000, and new cars £17,000, so that outstanding against their enterprise there was a liability of about £114,000. In addition, they would have to consider reconstruction of a great part of the tramway track at an early date, and ultimately they would be faced with a capital expenditure of about £200,000. At the same time, they honestly believed that the tramways would ultimately pay their way, and that the undertaking would be successful. They intended to link up with all the surrounding districts, and confidently hoped to overcome all difficulties.

PERSONAL.

Mr. R. W. Grubb, assistant engineer at Dewsbury Corporation electricity works, has been recommended by the Electricity Committee for appointment as borough electrical engineer.

Candidates for Tees-side Managership.—At the meeting of Stockton Town Council, on Tuesday, October 7, it was reported that the joint Parliamentary Sub-Committee of the Stockton and Thornaby Corporations, which have agreed with Middlesbrough to take over their respective sections of the Tees-side electric tramways system, had received 35 applications for the post of tramways manager in their area, and had selected the following six for interview prior to making the appointment:—Arthur C. Baker, chief assistant engineer, Birmingham Corporation Tramways; Chas. T. Baker, traffic manager, Electricity and Tramways Department, Blackpool; W. A. Luff assistant general manager, Yorkshire (West Riding) Electric Tramways Co., Wakefield; T. G. Richardson, tramways manager, Colne; A. B. Slater, general manager, Burton-on-Trent Corporation Tramways; John Telfer, general manager, Warrington Tramways and Stockton Heath Light Railways.

FINANCIAL.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended October 8 amounted to £91,297, an increase of £22,385 as compared with the corresponding period last year. The route mileage was 141.67, the same as a year ago. From April 1 (the commencement of the financial year) to October 8 (twenty-seven weeks and two days) the total receipts were £2,233,836, an increase of £449.005 on the corresponding period of 1918.

Glasgow Tramways Deficit.—From a statement prepared by the general manager of Glasgow Corporation tramways, Mr. James Dalrymple, it appears that there was a deficit for the first three months of the financial year (June 1 to August 31) of £19,435. The total revenue during the period was £421,785, and the working expenditure £370,009. In addition, there were payments to the Paisley Tramways Company, £2,902; interest, £395; sinking fund £338; income tax, £21,575; depreciation and permanent way renewals, £46,000; making a total expenditure of £441,220. A special meeting of the Finance Sub-Committee will be held next week to consider the statement, together with the report of the general manager showing how the revenue could be increased.

TENDERS INVITED.

CITY OF SHEFFIELD TRAMWAYS AND MOTORS DEPARTMENT.

The Tramways and Motors Committee are prepared to receive Tenders for the manufacture and supply of Uniform Trousers, Reefers and Caps.

Particulars and Forms of Tender, together with Specification, may be obtained, and samples of articles giving a general idea of what is required may be inspected from the 13th October to 24th October, 1919, between the hours of 10 a.m. and 12 noon, and 3 p.m. and 5 p.m. (Saturday, 10 a.m. to 12 noon), at the Clothing Stores, Tramways and Motors Department, Shoreham Street, Sheffield.

Tenders (enclosed in official envelope provided) and samples to be delivered at the Tramways and Motors Department, Division Street, Sheffield, not later than Friday, 24th October, 1919.

Any Person or Firm sending in a Tender will be required to comply with the Council's Form of Clauses respecting Wages, Hours and Conditions of Labour and prohibition against assigning or underletting, as set forth in the "Conditions of Contract," a copy of which may be obtained from the undersigned upon application.

Dated this 10th day of October, 1919.

A. R. FEARNLEY,
General Manager.

Division Street, Sheffield.

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PRICE LIST OF TRAMWAY AND OMNIBUS SHARES.

Dividends Prev.	Dividends Last.	Name.	Paid.	Price, July 27, 1914.	Cash Oct. 9 or previous.	A week ago
5%	5%	Alabama Traction 5% 1st Mt. ..	—	67	62	63
2/9	2/9	Anglo-Argentine 5½% 1st Pref.	5	4¼	63/9	62/6
2/9	2/9	Do. 5½% Cum. 2nd Pref. ..	5	4¼	52/6	50/-
4%	4%	Do. 4% Deb.	100	91	66½	66½
4½%	4½%	Do. 4½% Deb.	100	98½	67	68
5%	5%	Do. 5% Deb.	100	96	65	63½
—	—	Associated Omnibus Co., Ord. ..	5/-	3/32	1/2	1/2
1/-	6d.	Auckland Elec. Trams. Ord. ..	1	1 5/32	20/3	20/3
5%	5%	Do. 5% 1st Mt. Deb. ..	100	102½	95	90½
7%	7%	Barcelona Trac. 7% Pr. Lien ..	100	—	102½	102½
—	1/-	Bath Electric Trams Pref. Ord.	1	¼	4/1½	4/1½
6d.	6d.	Do. 5% Cum. Pref. ..	1	9/32	11/6	11/6
4½%	4½%	Do. 4½% 1st. Mort. Deb. ..	100	72½	68	68
4½%	4½%	Birmingham Dist. Pwr. and Tract. Co. 4½% 1st Deb. ..	100	84½	72½	72½
14/-*	18/-*	Bombay Elec. Sup. & Tram Ord.	10	14	60	60
6/-	6/-	Do. 6% Cum. Pref. ..	10	11½	12½	12½
4½%	4½%	Do. 4% Deb.	100	96	77	77
5%	5%	Do. 5% 2nd Mt. Deb. ..	100	100	87	87
$1	$1	Brazilian Trac. & Power Ord. ..	$100	66	61½	58½
$1½	$1½	Do. 6% Cum. Pref. ..	$100	97	93½	91½
4/-	4/-	Brisbane Elec. Trams. Ord. ..	5	7½	5½	100/-
2/6	2/6	Do. 5% Cum. Pref. ..	5	5	76/3	76/3
4½%	4½%	Do. 4½% 1st Deb. ..	100	101½	93½	93½
8%	8%	Brit. Col. Elec. Ry. Def. Ord. ..	100	107	39½	38½
6%	5%	Do. Pref. Ord.	100	106	47	47
5%	5%	Do. 5% Cum. Pref. ..	100	103	55½	56½
4½%	4½%	Do. 4½% 1st Mt. Debs. ..	40	99½	85½	85½
4½%	4½%	Do. 4½% Perp. Con. Deb.	100	96½	60	56
£8*	£8*	Brit. Elec. Trac. Ord.	100	—	40½	40½
6%	6%	Do. 6% Cum. Part. Pref.	100	—	74½	75½
5%	5%	Do. 5% Deb.	100	92	82½	82½
4½%	4½%	Do. 4½% 2nd Deb. ..	100	77½	67	67
5%	5%	B. A. Lacroze 5% Mt. Deb. ..	100	100	82½	82½
2/6	6/-	Calcutta Tramways Ord. ..	5	7½	8⅛	8½
4/6	2/6	Do. 5% Cum. Pref. ..	5	5 5/16	78/9	78/9
4½%	4½%	Do. 4½% 1st Deb. ..	100	99½	69½	69½
1/-*	1/-*	Cape Elec. Trams.	1	¼	13/-	13/-
1/3	1/3	City of B. A. Trams	5	5½	80/-	80/-
4%	4%	Do. 4% Deb.	100	97½	70	70
5%	5%	Colombo Elec. Tram. & Ltg. Co. 5% 1st Mort. Deb.	100	95	77	77
5%	5%	Co. F.C. do. Jardin Botanico 5% 1st Mort. Bds.	100	93½	82½	84
5%	5%	Costa Rica Elec. Lt. & Trac. Co. 5% 1st Deb.	—	63½	47½	47½
4/-	7/-	Dublin United Trams. Ord. ..	10	8	7½	7½
6%	6%	Do. 6% Pref.	100	—	105	105
—	—	Hastings & Dis. Elec. Tram Ord.	10/-	1/32	1/9	1/9
1/2½*	1/2½*	Do. 6% Cum. Pref. ..	1	1/32	11/1½	11/1½
4½%	4½%	Do. 4½% Deb.	100	67½	60½	60½
10d.	2/-	Hong Kong Tramway	5/-	1/32	26/3	26/3
5%	5%	Do. 5% Deb.	100	87½	—	—
1/6	3/-	Isle of Thanet 5% Pref. ..	5	2½	39/-	35/7½
4%	4%	Do. 4% Deb.	100	73½	50	50
—	3%	Kalgoorlie Trams 6% B. Deb. ..	100	15	16	16
—	—	La Plata Trams. Ord.	1	¼	2/-	2/-
11/-	7/-	Lanarkshire Trams Co. ..	10	10½	12	12
5%	5%	Lancs. Un. Trams 5% Pr. Ln.	100	85½	76½	76½
5%	5%	Lisbon Elec. Trams 5% Mt. Debs.	100	95	67½	67
7½d.*	10½d.*	Llandudno & Colwyn B. Ord.	1	—	14/2½	14/2½
—	1½d.	London & Sub. Traction Ord. ..	1	½	2/6	2/3
6d.	6d.	Do. 5% Pref.	1	3/32	5/1½	5/4½
4½%	4½%	Do. 4½% 1 Mt. Deb. ..	100	75½	55	55
4½%	4½%	L.G.O. 4½% 1st Deb.	100	100	79	80
5%	5%	Do. 5% Inc. Deb... ..	100	88½	75	75
41/7½	41/7½	Lon. Unt. Trams. 4% 1st Mt. Db.	100	55	45	45
3/-	3/-	Madras Elec. 6% Pref. ..	5	5 5/16	80/7½	81/10½
5%	5%	Do. 5% Deb.	100	100	86½	86½
7½d.*	9½d.*	Manaos Trams & Ltg. Ord. ..	1	3/32	4/6	4/6
5%	5%	Do. 5% 1st Deb.	100	77	65½	65½
$1½	$1½	Manila Elec. R. R. & Light ..	$100	102	77½	77
4½%	4½%	Met. Elec. Trams. 4½% Deb. ..	100	85½	71	71
5%	5%	Do. 5% Deb.	100	87	73½	75
$1½	$1½	Mexico Trams. Common ..	$100	70	36	35
5%	5%	Do. 1 Mt. 5% G.B. ..	—	84	49½	53
—	—	Do. 6% Mt. Bds. ..	100	76	41	41
4½%	4½%	Montreal Trys. Co. 4½% Stg. Dbs.	100	100	96	94½
4½%	4½%	Do. 4½% Stg. Debs. (1922)	100	99	97	95
2/-	1/23/32	National Steam Car	1	½	19/3	19/-
9½d.*	9½d.*	New General Traction	1	½	8/3	8/3
1/1½	6d.	Northern Gen. Trans. Ord. ..	1	½	20/7½	20/-
4/-	3/-	Para Elec. Rlys. Ord.	5	4½	83/9	75/-
5%	5%	Do. 5% 1st Deb. ..	100	89½	75	75
—	—	Pernambuco Tram. & Power Ord	1	—	4/6	5/-
8½d.	8½d.	Do. 7% Non. Cm. Part Pf.	1	—	14/-	14/-
5%	5%	Portland Ry. 5% 1st Mt. 30 yr.	—	96	—	—
8½d.*	1/-	Potteries Elec. Trac. Ord. ..	1	½	14/-	12/9
6d.	6d.	Do. 5% Pref.	1	½	13/6	12/9
1/4	8d.	Provincial Trams. Ord. ..	1	½	18/4½	18/4½
3/-	3/-	Rangoon Tram. 6% Cum. Pref.	5	5½	80/-	80/-
5%	5%	Rhondda Trams. 5% 1 M. Deb.	100	88	82½	82½
5+	5%	Rio de Janeiro Try. & Pr. 1st Mt. 30 yr. 5% Gld. Bd. '35 ..	—	97½	89½	80½
5%	5%	Do. 1st Mt. 5% 50 yr. ..	100	89½	77	80½
5%	5%	Sao Paulo Deb. 5% 1st Mt. ..	$500	99	92	92
5%	5%	Do. 5% Perp. Deb. ..	100	99½	77½	77½
10/-	20/-	Shanghai Elec. Cons.	10	13	19	19
3d.	3d.	Singapore Elec. Trams. ..	5/-	¼	3/6	3/6
4%	4%	Sou. Met. Elec. Tram & Ltg. 4% Db	100	66	56½	56½
5%	5%	S. Elec. Trams. of B.A. 5% Mt. ..	—	100½	99½	99½
4½%	4½%	Toronto 1st Mt. 4½% Bds. ..	100	98	92½	92½
4½%	4½%	Tramways (M.E.T.) Omnibus 4½% Debs.	100	91	75	75
2/-	2/-	Un'd. El. Tr. Monte Video Ord.	5	4½	46/8	45/-
4½%	4½%	Winnipeg El. 4½% Deb. ..	100	94½	65½	65½
—	—	Yorks (W.R.) Elec. Trams. Ord.	5	¼	25/10½	25/10½
3/-	3/-	Do. 6% Cum. Pref. ..	5	½	75/6	75/6
4½%	4½%	Do. 4½% 1st Deb.	100	85½	70	70
—	—	Metropolitan Dist. Ord. ..	100	21½	21½	22
—	—	Undgd. Elec. Rys. of London ..	10	21½	61/3	60/7½
		Do. "A"	1/-	½	8/-	8/3
4½%	4½%	Do. 4½% Bds. of 1933 Rd.	—	99	100½	101
6%	6%	Do. 6% 1st. Cum. In. Db.	100	114	97	97½
4%	4%	Do. 4% In. Bonds Rd. ..	—	86	93½	92½

*Indicates dividend for the year. In other cases the dividend is for the half-year.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

Names.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1918.	Incr. or Dec.
Aberdare U.D.C. ..	Sept. 30	511	588	+ 77	26	13,378	+ 213
Aberdeen Corporation ..	Oct. 1	2,603	3,219	+ 616	17½	61 844	+ 13 442
Ayr Corporation ..	„ 4	551	561	+ 10	20	18,541	+ 3,436
Belfast City	Sept. 26	8,882	10,254	+ 1,372	26	268,896	+ 62,103
Birkenhead Corporation	Oct. 5	2,244	3,725	+ 1 481	26½	78,625	+ 18 810
Birmingham Corporation	Sept. 27	25,060	26,817	+ 1,757	26	666 241	+ 57 161
do. Motor Buses	„ 27	1,454	1,717	+ 263	26	45,750	+ 5,885
Blackburn Corporation ..	„ 24	1,827	2,085	+ 258	26½	62,081	+ 13,784
Bradford Corporation ..	Oct 4	1.693	13,177	+ 3,484	27	311,912	+ 61,357
Burnley Corporation ..	„ 4	2,371	3,384	+ 1,013	..	..	..
Burton-on-Trent Cor. ..	„ 5	421	505	+ 84	27	13,658	+ 2,414
Bury Corporation ..	„ 5	2,011	3,058	+ 1,047	26½	66,653	+ 9,819
Chatham & District ..	Sept. 25	1,382	1,525	+ 143	38	54,863	+ 8,196
Cork Electric	„ 25	600	823	+ 223	38	26,420	+ 2 093
Derby Corporation ..	Oct. 4	1,487	1,893	+ 406	27	52,774	+ 11 521
Dundee City	„ 1	1,980	2,663	+ 683	19½	51,902	+ 12,534
East Ham Corporation ..	„ 4	1,481	2,478	+ 997	26½	62,470	+ 10,865
Edinburgh	Sept. 27	8,693	10 262	+ 1,569	12½	157,191	+ 29,958
Glasgow Corporation ..	Oct. 4	29,926	36,605	+ 6,679	18	584,454	+ 64.410
Glossop (U.E. Sup. Co.) ..	„ 4	168	267	+ 99	40	8,994	+ 1,729
Huddersfield Corporation	„ 4	3,689	5,311	+ 1,622	27	184,347	+ 29.520
Ilford U.D. Council ..	„ 4	189	1,309	+ 320	26½	33,073	+ 5,686
Ipswich Corporation ..	„ 4	723	847	+ 124	27	26,388	+ 4,448
Isle of Thanet	„ 1	388	1,212	+ 824	52	49,983	+ 33,262
Kilmarnock Corporation	„ 4	267	295	+ 28	20½	5,944	+ 881
Lanarkshire	Sept. 25	3,740	4,153	+ 413	38	138,841	+ 738
Leeds City	Oct. 4	14,391	17,729	+ 3,338	27	454,422	+ 94,639
Leicester Corporation ..	„ 4	4,675	5,831	+ 1,156	..	..	..
Leyton U.D Council ..	„ 2	2,438	3,915	+ 1,477	27	86,324	+ 22,778
Liverpool Corporation ..	„ 4	19,156	27,382	+ 8,227	39½	875,280	+ 157,280
London County Council ..	„ 8	68,912	91,297	+ 22,385	27½	2,233 886	+ 449,005
Maidstone Corporation ..	„ 2	260	475	+ 115	26½	10,832	+ 2,893
Manchester Corporation ..	„ 4	27,526	32,796	+ 5,270	27	827,827	+ 134,406
Newcastle-on-Tyne Cor. ..	„ 4	10,516	9,506	+ 3010	26	258,441	+ 12,119
Northampton Cor.	„ 3	827	1,140	+ 313	27	34 658	+ 11,174
Nottingham Corporation	„ 2	5,723	7,748	+ 2,025	27	192,811	+ 36 223
Oldham Corporation ..	„ 5	3,406	4,955	+ 1,549	28	125,605	+ 27,055
Reading Corporation ..	„ 2	1,291	1,546	+ 255	26½	44.640	+ 7,633
Rotherham Corporation ..	„ 1	2,613	2,344	— 69	26½	55,801	— 5,912
Sheffield Corporation ..	„ 5	13,841	15,799	+ 1,958	27½	455,143	+ 80 178
Southampton Cor.	„ 3	2,476	2,546	+ 70	26½	73,850	+ 4,294
Southend-on-Sea Cor. ..	Sept. 24	1,473	2,312	+ 839	27	64 906	+ 26,555
South Shields Cor. ..	Oct. 4	1,164	1,484	+ 319	27	38,889	+ 7,771
Sunderland Corporation ..	„ 10	2,189	2,743	+ 554	27	79,600	+ 22,424
Torquay Tramways ..	Aug. 14	1,700	2,019	+ 319	32	34,385	+ 6,037
Tyneside Trys. & Trmrds.	Sept. 17	941	1,233	+ 292	12	14 379	+ 919
Wallasey Corporation ..	Oct. 4	1,073	2,485	+ 812	26½	71,967	+ 18,736
Walsall Corporation ..	„ 4	1,221	1,728	+ 507	27	39,094	+ 5,667
Walthamstow U.D. Coun.	„ 4	1,348	1,836	+ 488	27	48,459	+ 6,387
Warrington Corporation	Sept. 25	809	924	+ 115	25	22,663	+ 3,426
West Ham Corporation	Oct. 2	4,740	6,753	+ 2,013	26½	145,271	+ 23,738
Wolverhampton ..	„ 8	1,677	2,079	+ 402	27	55,669	+ 8,208

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

Name.	Week or Month.	Latest Return. 1917-18	1918-19	Wks.	Aggregate. 1918-19	Increase or Dec.
Anglo-Argentine	Oct. 7	£61,185	£70,321	40	£2,292,706	+ £60,975
Ballarat and Bendigo (4 wks)	July 20	2,948	2,961	16	13,799	+ 394
Brazilian Traction (Mirs.)	A	9,491,000	9,734,000	34	73,767,000	+ 5,118,000
Brisbane	Sept.	35,400	41,970	38	346,370	+ 20,516
British Columbia .. .. $	Aug.	544,839	667,170	9	1,309,260	+ 350,953
Buenos Aires Lacroze ..	„	40,006	45,310	13	137,378	+ 13,410
Burmah Tram. & Light Rs.	Aug. 31	41,855	43,683	4	43,683	+ 1,828
Calcutta .. .. Rs.	Oct. 4	82,771	92,175	39½	..	+ 457,921
Carthagena and Herrerias	Sept.	2,549	1,539	35	25,504	— 12,897
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	Sept.	1,939	2,831	6	5,592	+ 1,678
Hong Kong .. .. $	Aug. 23	15,554	12,777	34	499,402	+ 35,630
Kalgoorlie	May	2,707	2,795	22	13,196	— 42
La Plata	Sept.	4,999	5,540	39	51,043	+ 4,728
Lima	July	45,964	49,025	30	331,932	+ 29,742
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras .. .. Rs.	Sept. 15	35,470	51,193	36	699,455	+ 48,079
Manila .. .. $	June	183,250	160,670	26	1,207,412	+ 170,313
Montevideo	Sept.	29,611	35,552	47	404,501	+ 57,428
Para	Aug.	24,672	24,890	39	221,626	+ 3,020
Pernambuco	Oct. 5	4,211	5,870	39½	205,305	+ 28,523
Peruvian .. .. $	July	987,300	1,058,730	..	..	..
Rangoon	Sept.	6,067	6,812	39	58,472	+ 2,892
Shanghai (2 weeks) $	Apr 23	50,760	56,755	16	447,279	+ 53,577
Singapore .. .. $	Aug. 9	15,157	15,601	32	488,896	+ 51,278
Toronto .. .. $	Aug.	1,070,567	1,083,741	34	8,194,299	— 282 373
Winnipeg .. .. $	Aug.	288,974	353,194	34	2,565,812	+ 177 345

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THE
ENGLISH ELECTRIC COMPANY LIMITED,
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THE Tramway & Railway World
WITH MOTOR TRAFFIC SECTION

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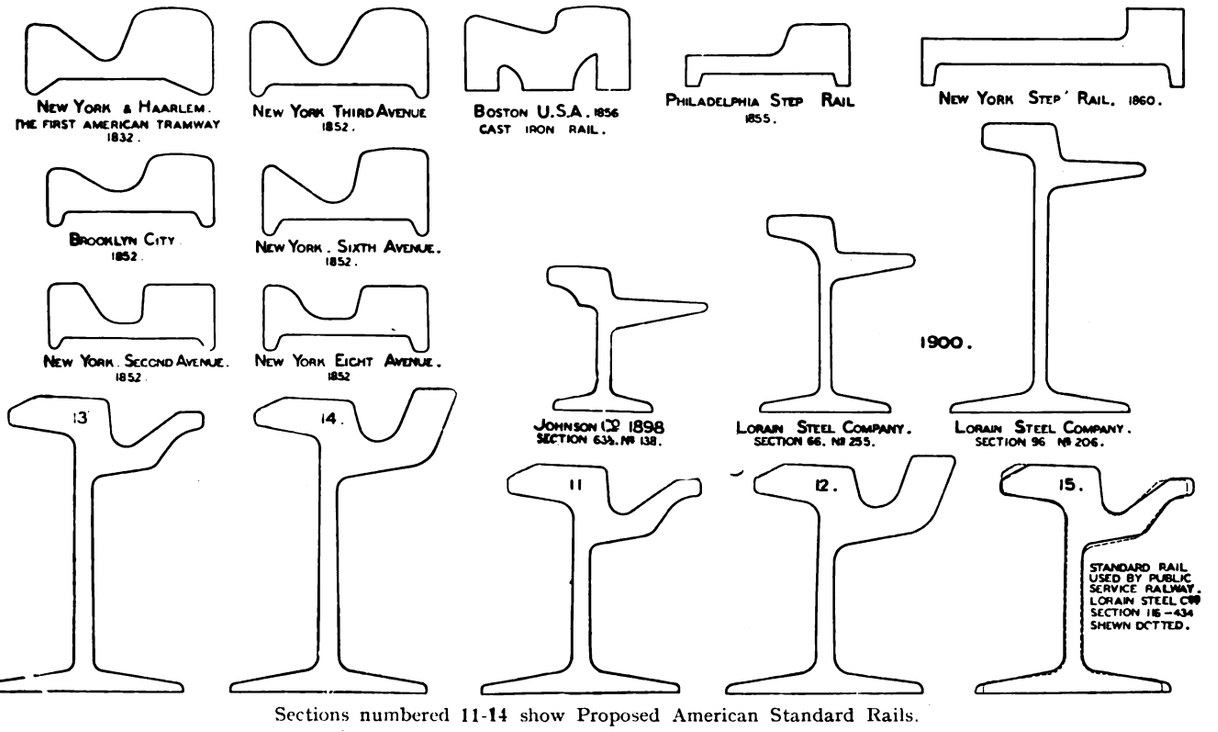
EVOLUTION OF A TRAMWAY RAIL.

By FRED. BLAND.

It is sometimes interesting to spend a few minutes considering the origin and evolution of things, whether inanimate or animate, and where one produces the other it is still more so; and a tramway rail comes under this description. Tramway evolution can be divided under several heads, but the intention of this article is to follow the evolution of the tramway track rail, which has gone through many vicissitudes. As railways were produced by evolution, so were tramways. Man was content to tramp, while his betters went on horseback, or in heavy coaches, Sedan chairs, etc. increasing during the following reigns. Lancashire very early adopted cobbled pavements (still a feature). The benefit of these was soon seen, and the paths were gradually widened for vehicles until the street was "cobbled" to local ideas.

In 1610 one Thomas Proctor published a small book on this subject, giving drawings of several designs. His chief idea was a causeway of small cobbles, stones or hard matter as a filling, large wooden frames keeping the cobbles together—a very different matter to the reinforced concrete of the present day. It was not,


NEW YORK & HAARLEM. THE FIRST AMERICAN TRAMWAY 1832.
NEW YORK THIRD AVENUE 1852.
BOSTON U.S.A. 1856 CAST IRON RAIL.
PHILADELPHIA STEP RAIL 1855.
NEW YORK STEP RAIL. 1860.
BROOKLYN CITY 1852.
NEW YORK. SIXTH AVENUE. 1852.
NEW YORK. SECOND AVENUE. 1852.
NEW YORK EIGHT AVENUE. 1852
1900.
JOHNSON CO 1898 SECTION 63½. № 138.
LORAIN STEEL COMPANY. SECTION 66. № 255.
LORAIN STEEL COMPANY. SECTION 96 № 206.
13.
14.
11
12.
15.
STANDARD RAIL USED BY PUBLIC SERVICE RAILWAY. LORAIN STEEL CO SECTION 116-434 SHEWN DOTTED.

Sections numbered 11-14 show Proposed American Standard Rails.

Fig. 1.—Progress of American Tramway Rail Design.

Digressing slightly, the question of roads was the first important turn of the wheel. In the 17th century the art of roadmaking was unknown. In dry weather the so-called roads were dust and in wet weather a quagmire. Road mending frequently consisted of dumping loads of rubbish or stone into the worst places, according to local fancy. Occasionally rough horse paths were constructed, and paved with rough flags or cobbles raised a foot or two over the soft surfaces, sometimes protected by posts. These began to be seen in the time of Henry VIII., gradually however, until 1815, when "Macadam" brought out his patent road, that street transport really began to improve, and very slowly. In 1828 the first omnibus appeared. In 1830 came the first hansom, and these conveyances served for over 70 years, the bulk of the people being content to walk.

Commencing in 1832, we find that America conceived the idea of teaching pedestrians to ride, but it was 50 to 60 years before this idea became imbued in the public mind, and 80 years before street tramways were brought to their present efficient state.

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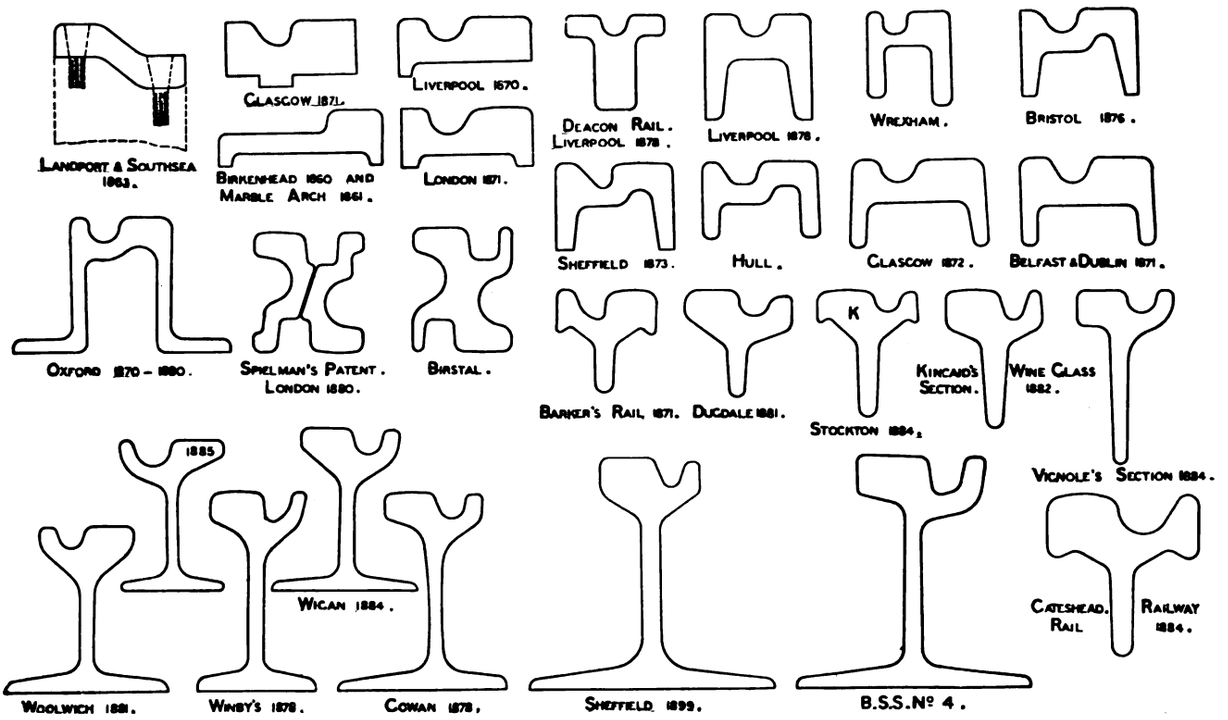

Fig. 2.—Types of British Tramway Rails from 1860.

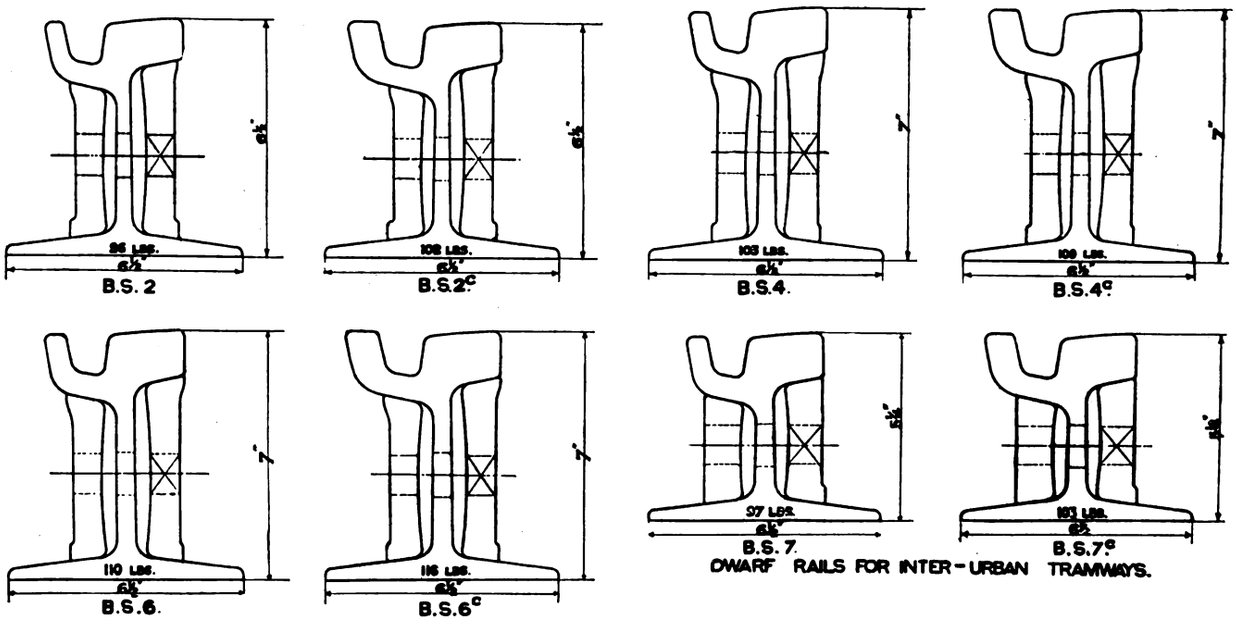

Fig. 3.—Sections of British Standard Rails, 1917.

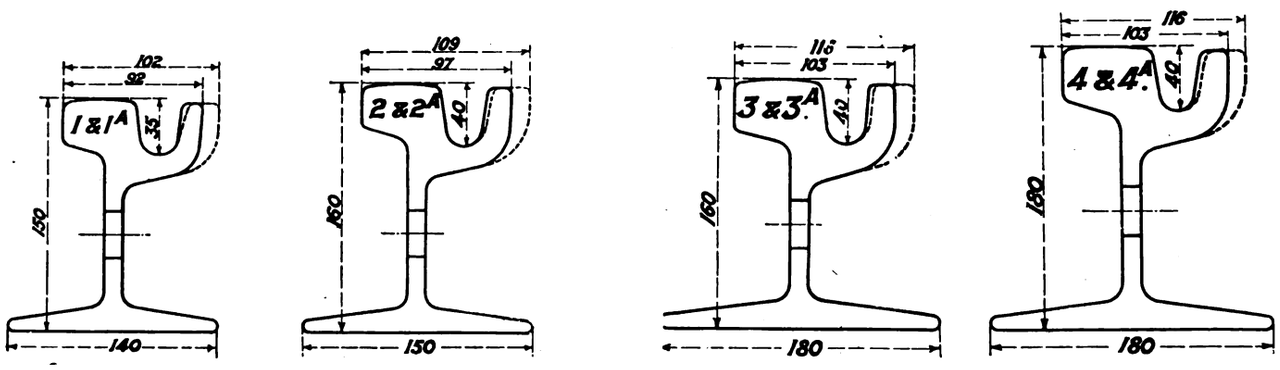

Fig. 4.—German Standard Rails.

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Now commences the "evolution of the tram rail." Fig. 1 is a diagram showing the progress of American tramway rails. The first section shows the rails originally laid in New York in 1832, which, however, did not take the public fancy, and it was not until 1852 this track was again revived by a French engineer (Mons. Loubat), who rolled the first grooved tram rails, which were known as "gutter rails." In 1856 Boston (U.S.A.) put down the rails shown, which this time were laid down by an Englishman, Mr. Chas. E. Light.

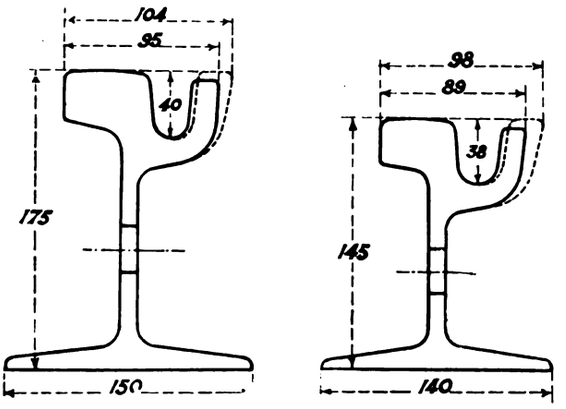

Fig. 5.—French Standard Rails.

These rails were cast-iron, and weighed 75 lb. per yard, and remained in use several years. Then Philadelphia put down the first "step" rail, weighing 48 lb. per yard 5 in. wide, but in 1860 New York laid a "step" rail 8 in. wide, and the diagram shows the progress to the present day, the sections selected being typical of American track, increasing in depth up to 9 in. as compared with the original flat rail. This diagram also includes the standard sections as proposed by the American Association. Many American engineers still, however, prefer the step as against the Trilby or grooved rail.

We now compare English progress, as illustrated by Fig. 2. In sequence we commence with the Birkenhead "step" rail in 1860, and put down at the Marble Arch in 1861, but here the public objected so strongly to the rails being laid in the roads that "step" rails were never again used in England. The next section was used at Landport and Southsea, and is a sort of transition step between the "gutter" and the later "box" rail. Grooved rails now claimed consideration, and we see the various attempts to solve the track question. Glasgow in 1871, Liverpool 1870, London 1871, lead up to the "box" type of rail, of which the diagram shows eight different types, all resting and fastened on sleepers or chairs in some form or other. Then follow five types of web rails leading to the girder rail, and finally the British standard rail is reached.

There were attempts even then to make a renewable or reversible rail, of which two sections are shown, but beyond trial tracks they were not continued. Since then and up to the present day there have been numerous attempts to design a "renewal" rail, but with the exception of the "Romopac," tried at Leeds, all have been useless.

The rails can be divided into classes, viz. :—

(1) Rails laid on sleepers, continuous or otherwise.

(2) Rails requiring to be cottered or rivetted on to angle plates, giving less elasticity, but increased strength, such as "Kincaids" or "Vignoles."

(3) Rails such as Vignoles, Kincaids, Barkers, etc., supported on isolated chairs.

(4) Renewable and reversible rails.

(5) Girder rails on sleepers embedded in concrete, such as the "Winby."

(6) Girder rails laid direct on concrete, which is now the usual custom.

The Kincaid and Vignoles rails were the beginning of the girder rail, viz., the web by which it was cottered down.

Experience had proved by 1880 that loose parts were not suitable, but still they continued in use for many years, and it was the Gowan rail which instituted the single rolled rail, and this now rules, being a case of the "survival of the fittest."

This rail was patented originally by Charles Brun in 1860, twenty years before it came into use, the groove being planed out as was done by the Barrow Company in 1882; re-invented and patented in 1877 by Mons. Le Grand, Paris; modified and patented in 1878 by J. Gowan, its features being a wider flange on the tread side. This rail was used in Edinburgh, Dundee, and Glasgow in 1877-79. This rail was first rolled in Sheffield—a fact little known. It might here be mentioned that the first German rolled girder rail was laid in South London in 1878, and that Messrs. Dick, Kerr and Company claim to have supplied the first girder rail (Belgian or German make) with rolled groove in 1880 to Ipswich. The weight was 58 lb. per yard.

Up to the introduction of mechanical traction, the wheel of evolution turned very slowly, then a strong arm gave the wheel a turn, and for the next ten years it moved more rapidly. Tram rails followed every type of traction, increasing in weight, height, and width, from the horse system, through cable and conduit, to the overhead electric system, which has now been adopted throughout the world. This brings us to the present day rails. Fig. 3 shows the English standard rails as revised in 1917, but not yet fixed officially. Fig. 4 shows the German standard rail sections, and Fig. 5 the French standards.

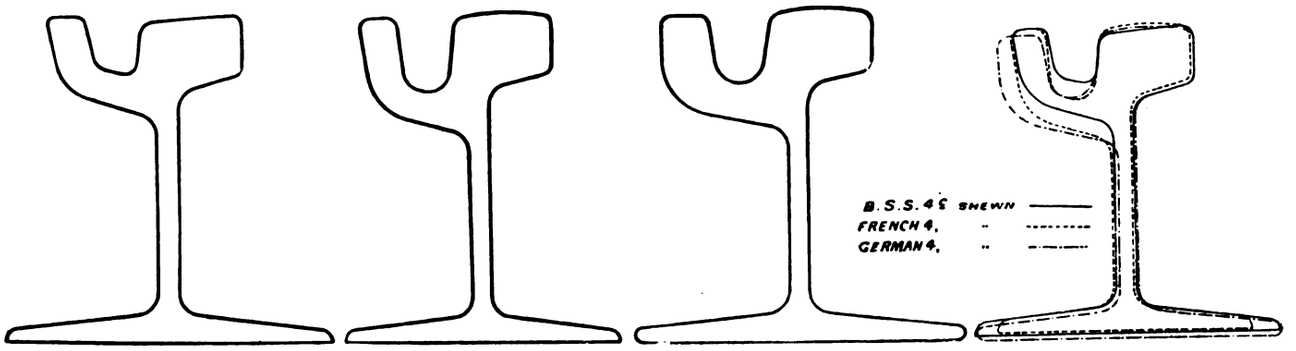

Fig. 6.—Some English, French, and German Standard Rails Compared.

The French and German sections are characterised by an extra depth of ¼ in. in the groove, with consequently a thicker head, which the English rails never

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had. Comparing the German No. 4, the French No. 4 (or U.T.F.), with English No. 4c, we arrive at the combination shown in Fig. 6, and there is no doubt that it is quite possible to roll a section common to all if prejudice and politics were ignored. It is also quite certain that English engineers to-day would be delighted if their rails possessed the deep groove of the foreign tramways, as they would then be independent of either the planing process or hardening *in situ*, or at all events could have deferred the trouble. But the Board of Trade unfortunately intervened.

Fig. 7 is a carefully selected sheet of grooved girder rails sections used in the principal towns of the Continent and Japan, and are interesting when compared with the British Standard No. 4 shown on the same

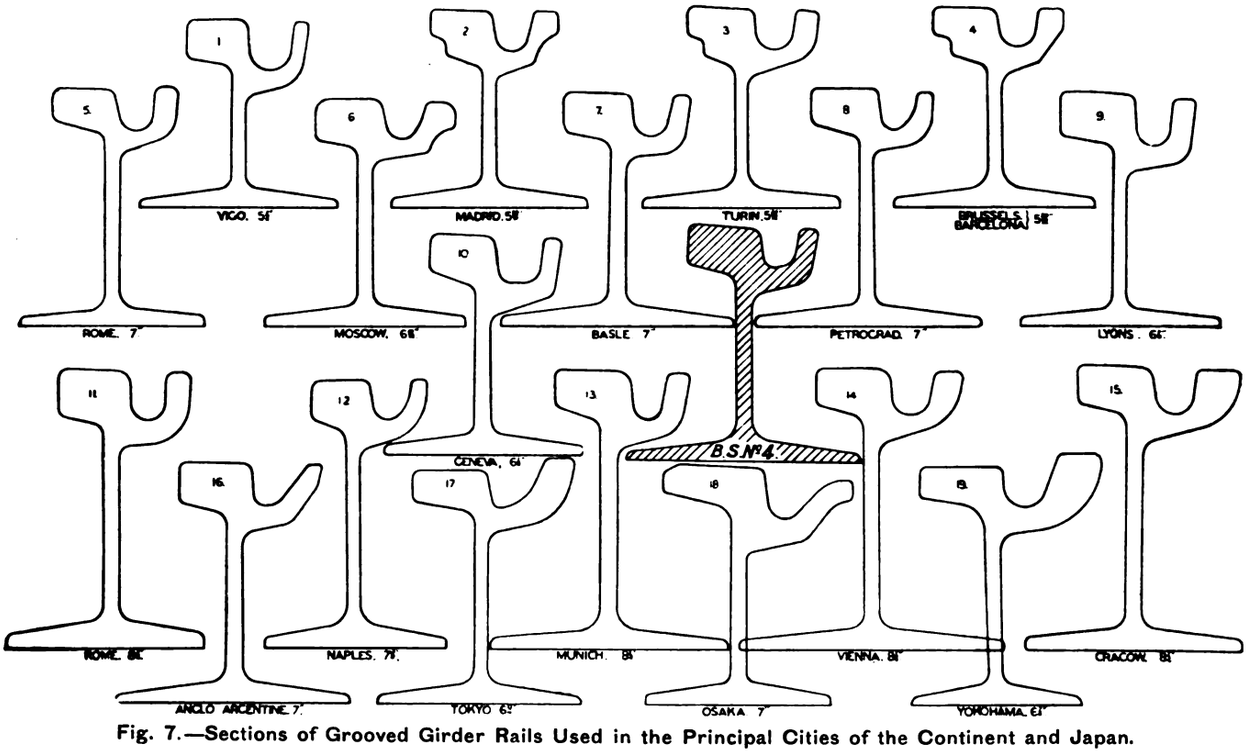

Fig. 7.—Sections of Grooved Girder Rails Used in the Principal Cities of the Continent and Japan.

illustration. The No. 4 rail, together with the British Standard No. 1 rail, are actually superseding many of the foreign sections shown, and there is no question that standard rails could be used more generally.

MANCHESTER TRAMWAYS EXTENSIONS.

The Parliamentary Committee of Manchester City Council have decided on the main provisions of the Improvements Bill they intend bringing before Parliament during the session of 1920. Among the most important items are the street widening and tramway schemes. New roads are projected from Aytoun Street, in a southerly direction, along a widened Coburg Street; another runs from the junction of Higher Cambridge Street and Coupland Street, connecting Carter and Lloyd Streets with Cambridge Street. Land is to be acquired on the basis of a provision that the capital required shall be mostly raised on the credit of the revenue of the Corporation tramways undertaking.

Powers are also sought to construct tramway terminals at St. Peter's Square, Stevenson Square, Cannon Street (Corporation Street), and Parker Street (Piccadilly), and for the making of new tramways and connections with existing lines. The principal connections to be made are:—Piccadilly tramway with the Great Ancoats Street lines; Whitworth Street West to join Lloyd Street route; a double line commencing by a junction with existing tramway in Albion Street, thence proceeding in a south-easterly direction along Medlock Street, terminating at a junction with Stretford Road tramway.

A number of other lines, both double and single, are proposed, and the scheme seems well calculated to accomplish its aim of providing Manchester with a complete system of tramways.

ILFORD STANDARD TRAMWAY CAR.

At the present time tramway authorities are not in haste to change from the accepted type of car to any other, but they are ready to adopt improvements in details, while preserving an open mind towards the future. Ilford Urban District Council has followed the safe policy in selecting the pattern for the new cars they require for immediate service; for, as will be seen from the accompanying drawings, the new cars will be of the single truck top-covered type with 18 ft. 6 in. bodies. Mr. L. E. Harvey, the general manager and engineer, has found this type so satisfactory in service that he had no hesitation in advising the Tramway Committee to adhere to standard patterns and dimensions; but there are several features in the details of the structure that merit more than passing notice, although in the main structure ordinary lines are followed. The underframe is of mild steel channel lined with teak, all the crossbars being of oak secured by knees, excepting the crossbars taking the platform bearers, which are of mild steel channels, and bolted to the side frames. Of mild steel section, the platform bearers are bolted to the steel crossbar of the underframe, and they carry the buffers secured by bolts. At both ends of the car the dashplates are of No. 12 SWG sheet steel, headed by half-round beading, and supported by wrought-iron stanchions, which also hold up the iron rail to which are attached the top of the controller, the brake spindle brackets, and corner step stanchions. Opposite the centre of the step, which is suspended by malleable iron hinged brackets from the platform, is the main entrance stanchion, the side stanchion being fixed to the end of the dashplate, both consisting of ¾-in. bore iron pipe with brass grab sleeves.

The stairs have ample clearance for passengers, the stringers and risers being of No. 14 SWG steel plate, and the treads of oak fitted with iron step treads. Top rails on each side of the stairs are of ⅞-in. diameter brass and the bottom rails are ½-in. bore steam pipe. Staircase standards consist of wrought-iron, the feet

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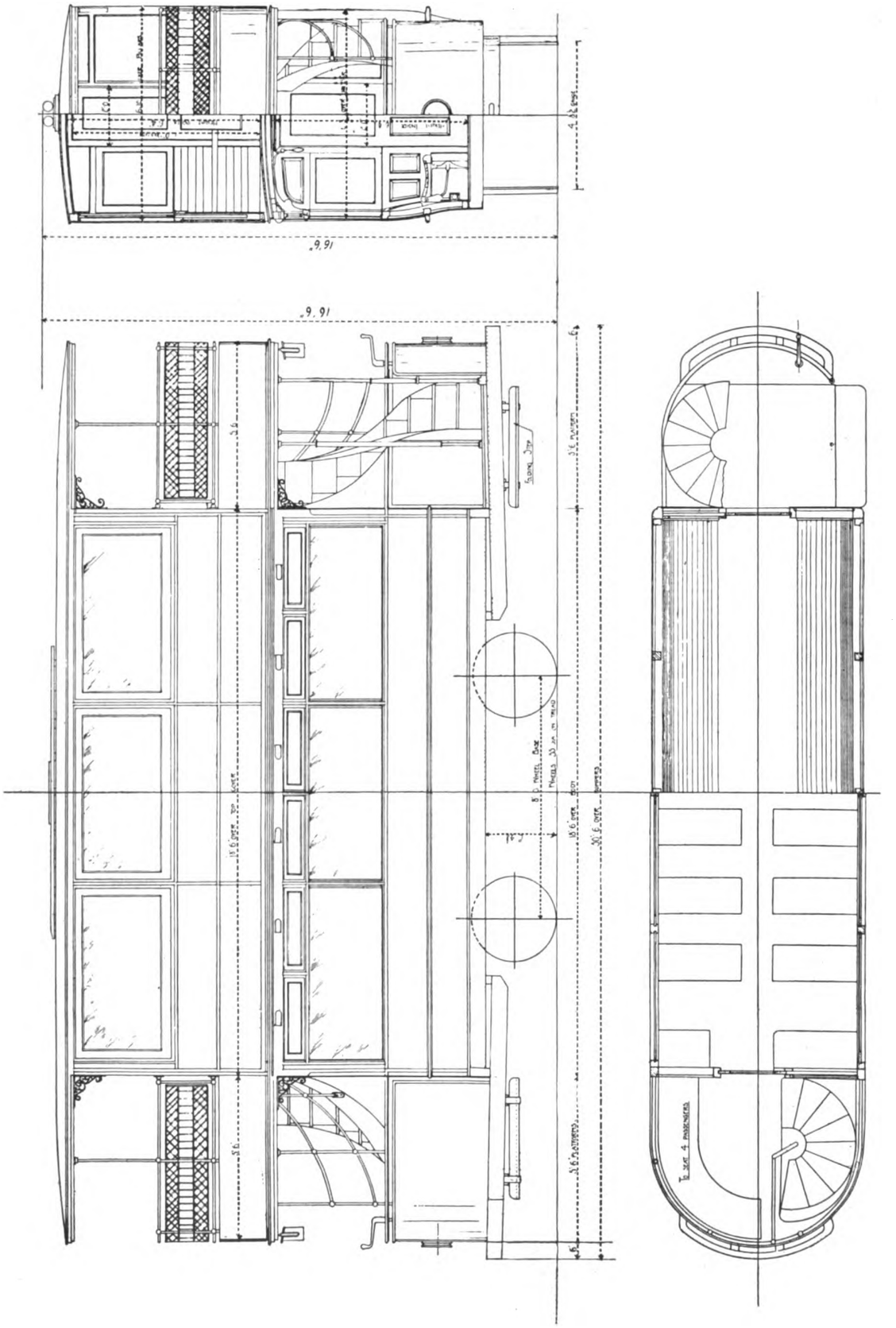

Elevation, Plan and Section of Single Truck Top-Covered Car—Ilford Council Tramways.

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bolted through the floor. Roof hand rails are of $\frac{5}{8}$ in. bore wrought-iron steam pipe, and the rail stanchions have been bolted through the canopy roof. Rivetted to the latter are the end decency plates, which are made of No. 16 SWG sheet steel.

Looking now at the main body of the car, it will be noted that the lower saloon has three windows on each side, with six ventilator windows above, and over these six air ventilators, while the upper saloon is similarly constructed. In both upper and lower saloon, at diagonal corners nearest the stairs, are casement windows fitted with strong hinges and grip-fast fasteners. Fixed windows are placed in the corners opposite, with guard rods of suitable dimensions. The window frames are of oak, those in the upper saloon being fitted with Laycock's patent balanced springs and independently movable up or down. Doors in the lower and upper saloons are single sliding, made of oak, with glass panels in the upper portion and fielded oak in lower panels. Hung on Laycock's patent ball-bearing runners at the top, the doors are fitted with strong Kaye's locks and striking plates.

The construction of the whole car is of durable quality, and well designed to stand the wear and tear of operation. Floors are of pitch pine, tongued and grooved—that of the lower saloon and platforms strengthened with slats of hardwood, while the upper saloon floor is covered with standard roofing canvas, with wearing slats fixed on top. Corner pillars, window pillars, and door pillars consist of teak wood, the last-named being fitted with wrought-iron straps bolting them through the platform, and strong flat iron U piece running along the floor of the doorway bolted to each pillar. Roof rafters are of seasoned wood, and strengthened by wrought-iron strips $\frac{5}{16}$ in. thick, the ends turned and bolted to the cantrails, while the roof itself consists of pitch pine tongued and grooved and covered with standard roofing felt. Waist and end panels are of seasoned mahogany; fascias, rocker panels, and side boards of Canary whitewood. All the panels are well secured to the frame, canvassed and glue-blocked to rib rails and posts. At the backs of the panels are provided strong trusses of 2 in. by $\frac{1}{2}$ in. wrought-iron running the whole length at both top and bottom, the trusses being screwed to the panel ribs and posts where they cross. The ceilings are of aluminium sheet in three panels, screwed with round head brass screws to the rafters, and the joints are covered with suitable moulding, the interior mouldings being of oak and of simple design.

The seats of this car are of Rayner's patent "Kleen-car" type, those in the lower saloon being hinged longitudinally and composed of oak of the lath and space type. Upper saloon seats are of the garden type, with reversible backs.

The lighting of the Ilford car has been arranged according to the latest ideas of illuminating science. Six lights are fitted in the lower saloon and five in the upper, two lamps in the lower saloon being in series with three in the upper saloon, the same relation being established between the other three in the lower and the remaining two in the upper saloon. The sixth lamp in the lower saloon is in series with two lamps in each destination indicator. Headlights are fixed in each dashboard, and suitable platform lights are installed. Platform lights and headlights have been arranged so that the front headlight lamp is in series with the two side headlights, the rear red light and a lamp fixed to the underside of the rear canopy, the series having a change-over switch which operates a similar series when the car is running in reversed direction. Holophane globes are used in the interior of the saloons, and the lamps have been placed so as to be out of the way of the passengers and at the same time give a diffused light.

The fittings of the car are of the latest type, and the electric equipment is complete and thoroughly protected. Conductor's bells of single stroke are fitted on the canopy at each end of the car, and may be operated by the passenger in the lower saloon through a leather pull-cord, and a striking knob with fitments is placed near the stair at each end of the upper saloon, which may be operated by passengers wishing to alight.

All the wiring is easily accessible, the cable used for lighting being of Pernax make and of 2,500 megohm grade, while that of the main trolley and connections is of vulcanised india-rubber and of equal grade. A main circuit switch is fitted under the canopy of the car, capable of breaking circuit of 500 volts at full load, and equipped with magnetic blow-out. At the other end of the car from the main switch is an automatic circuit breaker, with trip gear to release, protecting the motor from excessive current, and adjustable to various loads from 100 to 200 amperes.

The car is borne on a four-wheeled truck of the Peckham pendulum type, with an 8 ft. wheel base. Wheels are steel tired, the tires consisting of Siemens-Martin acid steel, and turned up on the sides, tread and flange. The wheel centres on which the tires are shrunk are 26½ in. diameter, with 2½ in. face. Axles are mild steel, 4 in. in diameter, with the wheels pressed on by hydraulic power of about 30 tons.

The motors are of the "B.T.H." GE, 200 split frame form "C," ventilated inter pole, 35 H.P.

In external appearance the cars are pleasing to the eye, a combination of sage-green and cream; main panels are green, and the rocker and lower end panels are cream in colour. Inside the car the wood is varnished natural colour, while the ceilings are white.

The general dimensions are as follow:—

	Ft.	In.
Length of body over corner posts	18	6
Length of each platform	5	6
Length over platforms	29	6
Length over buffers	30	6
Width of lower saloon over pillars	6	8
Width of upper saloon over pillars... ...	7	0
Width over roof	7	0
Clear height at centre of lower saloon ...	6	9
Clear height at centre of upper saloon ...	6	4
Height of doorway of lower saloon... ...	6	1
Height of doorway of upper saloon ...	6	0
Gauge	4	8½

The seating capacity of the car is 64, the lower saloon holding 26 passengers, the upper saloon 30, the canopies at each end seating four passengers each.

LONDON COUPLED CARS MOVE CROWDS.

As the result of the railway strike the London County Council Tramways were called upon to deal with a traffic that exceeded all records. Of the manner in which the duty was discharged nothing but praise can be recorded. The employees everywhere met the week's enormous rush of traffic with tact and great good humour. Once more the two-car trains proved their unexcelled utility for dealing with heavy traffic. Introduced early in 1914, after the keenest opposition by the Police Department, the trailer cars (the value of which we had insisted upon for many years) may be said to have proved the salvation of the tramways throughout the war. They also have the merit of relieving the crush at the shelter queues at the Blackfriars end of the Victoria Embankment, for passengers can join them at the same fare at any point on the Embankment. The accompanying photographs show the coupled cars in service and a portion of the crowd in queue formation between the two sheltered loading stations.

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London County Council Tramways in the Railway Strike.
Passengers in Extended Queue waiting to enter Sheltered Loading Platforms.

Motor Car and Trailer on Victoria Embankment, London.
An End of the Enclosed Loading Platform is seen on the left.

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THE
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THE EDITOR will be glad to consider articles by experts. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, OCTOBER 16, 1919.

Railway Strike and Settlement.

For the space of ten days, from September 26 to October 6, the tramway authorities of the country were held in suspense on the brink of calamity. The situation was curiously complex. After difficult negotiation, the questions at issue between tramway owners and workers had been brought into arbitration, and though the method was defective in many respects, the Interim Court seemed likely to provide a basis of settlement. Suddenly came the strike of the railwaymen, which threw an enormous addition of work upon the tramways and road transport services generally. While each transport authority was straining every nerve to cope with the increased traffic, attention had to be maintained on the course of the proceedings in the arbitration court. Then there was the fact that the transport workers were pledged to active support of the railwaymen, and on Monday, September 29, the representatives of the transport workers held a conference at which sympathetic action was postponed, but not abandoned. It was clear that, unless some form of settlement between the railwaymen and the Government could be arranged, a complete stoppage of the tramway services of the country was inevitable. Such an occurrence would have rendered futile all the labours of the Interim Court of Arbitration, and involved the tramway industry in common with the whole country in a chaotic struggle the end of which no man could foresee. Happily the leaders of the transport workers realised their responsibility, and instead of reinforcing the elements of strife, undertook the nobler role of mediation. The part played by the tramway representatives in this crisis greatly redounds to their credit, and should be recognised. Other trade union leaders added their efforts to the cause of mediation, and a Conciliation Committee was formed, consisting of officials of nearly all the great labour combinations in the country. As a result of patient and continued intervention, an agreement was reached on Sunday, October 5, by which resumption of work by the railwaymen was rendered possible. Now that settlement has been effected, the whole course of the affair becomes clear. Rightly or wrongly the National Union of Railwaymen believed that the action of the Government in regard to their wages and terms of employment presaged an effort to reduce their rates of pay to the pre-war level, and the workers all over the country seemed to feel that it was the beginning of an attack upon wages generally. After November the Wages (Temporary Regulations) Act would cease to exist automatically, and the wages of the railwaymen stood to be revised at the end of the year. To anticipate the evil they thought was impending, the railwaymen demanded that their wages should be stabilised on a war basis at once—for that, apart from minor details, was the real meaning of their claims. The Government, in reply, laid down terms which left the postion of the larger section of railway workers insecure. In the belief that this was the last word of the Government, the leaders of the railwaymen at once declared a strike. Taken by itself, the sudden strike on a matter for which there yet remained two months of negotiation seemed an unjustifiable assault upon the nation, but the point need hardly be insisted upon now, except that it afforded ample justification for the Government in their demand that the men should return to work before final negotiations were resumed. In the end, however, both parties

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gave way to a certain degree. On the one hand, the Government stated their terms, and on the other hand the railwaymen undertook to resume work at once. The railwaymen accepted a limit to stabilisation of present wages, the period being fixed at September 30, 1920; the Government conceded that the minimum rate of wages should be 51s. for all adult railwaymen until the cost of living falls below 110 per cent. above pre-war level. It is a triumph of conciliation, and the transport workers have good cause to congratulate themselves upon the happy ending to which they have so powerfully contributed. The settlement, it is to be hoped, forecasts an equally agreeable close to the case of the tramway arbitration.

Road Transport in the Strike and After.

The remarkable achievement by the Government during the recent railway strike in transporting food supplies by road is likely to give the public an even more vivid realisation of the value and importance of the heavy road motor vehicle than anything that was done during the war. The work by such vehicles while hostilities were in progress was, like other war work, shrouded in mystery, but there was nothing hidden as regards transportation during the strike. The experience gained by the authorities in war time, the existence of a great number of vehicles practically ready for work, the organisation in reserve, and the rapid response of volunteers as drivers and helpers enabled the Government to take up on the spot the work dropped by the railways, and to ensure that there should be no scarcity anywhere. The strikers reckoned without the motor lorry, and no one was more surprised than they at the discovery that the railways had so powerful a coadjutor. Moreover, the public have been given confidence that no future general strike will starve them out. At the same time they must not be led away with the idea that road motor traction can be anything like a full substitute for railways. Only food and other urgent necessities could be transported. All the mineral and heavy goods traffic of the railways was practically at a standstill; so was all really long-distance traffic. As to the transportation of passengers, everyone knows the condition to which it was reduced. In that connection, however, much valuable work was done by motor omnibuses and chars-a-bancs. It is satisfactory to note that the Ministry of Transport are to use the mobilised fleet of lorries to clear up the congestion of goods at the ports which was bad enough before the strike and was worse after it. The reason why little was done in this way before is probably to be found in the fact that the existing powers of Government departments as to transport were about to be or were in process of being transferred to the new Ministry. So it comes about that one of Sir Eric Geddes' first important tasks will be in connection with fully organised motor services to clear up arrears at docks and railway stations. Then there will be a chance for a good start with all the transport improvements to which the country is looking forward.

The Motor Omnibus in Service.

At the annual conference of the Municipal Tramways Association, Mr. A. R. Fearnley, in his paper on "Motor Omnibus Services," reinforced the argument that there is no necessary antagonism between the motor omnibus and the tramcar, but that both can find ample employment in the public service, each in its own special way. Mr. Fearnley studiously avoided abstract theory and first principles, adhering closely to the facts of experience and analysing results. To speak of partisans of the tramcar is palpable nonsense, because the tramway system occupies the place of power and it is the omnibus service which has to be promoted by agitation. For the superiority of service by the tramcar Mr. Fearnley's cool analysis of actual operating results furnishes very powerful reasons. The manager of Sheffield's tramways and motors showed, for instance, by figures which are beyond question that the motor omnibus costs 33·7 per cent. more than the tramcar to operate per mile, that the total expenses per passenger are 176 per cent. more on the omnibus than on the tramcar, and the comparison per seat provided works out at 114·1 per cent. higher on the omnibus than on the tramway car. Though the fare charged on the Sheffield omnibuses was 1½d. per mile, while that on the tramways is less than 1d., or a difference of 130 per cent., the

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omnibus receipts were only 23·5 per cent. per mile run higher than the same on the tramways. It might be said, on this showing, that the facts are all in favour of the tramway and against the omnibus, but that is absurd. Mr. Fearnley does not reach any such conclusion. He merely showed that the cost of running omnibuses is higher than the cost of running tramways under conditions equally suitable to both. The Sheffield manager did not advise that tramways should be substituted for omnibuses on all routes; quite the contrary, he advocated the utilisation of omnibuses to the utmost, pointing to the great service they can perform for the tramways by developing traffic, by acting as feeders to outlying termini from adjacent districts, and as auxiliaries at times of special congestion on tramway routes. But the figures given by Mr. Fearnley show that both passenger and undertaking must be prepared to pay the price of the omnibus service. On the one hand the passenger pays 130 per cent. more for his ride, and the authority or owners of the omnibus must be content with a lower ratio of receipts over expenditure. If there are enough passengers desirous of travelling by omnibus on a given route willing to pay the higher fare, then it is the duty of the local authority to provide the service. The demand is there, and the supply ought to be forthcoming.

The Municipal Tramways Association.

The Municipal Tramways Association may be congratulated on the successful return to the pre-war conditions that characterised its annual conference at Dundee. In attendance and general interest the meeting easily takes rank with those which preceded the war, but the Dundee conference will be especially memorable in the history of the Association because it marks the beginning of a new epoch. By the adoption of amendments to the Articles of Association confining the full membership to Corporations, and fixing the subscriptions on a new and enlarged basis, the Association should at once be provided with resources adequate to the importance of the work which devolves upon it. This change is accompanied by reorganisation of its work rendered possible by the recent appointment by the Executive Council as general secretary of Mr. J. Beckett, who has already given abundant evidence to every member of the able and enthusiastic service which he will devote to the welfare of the Association. It was indeed time that the Council should have the assistance of a permanent official. Year by year the work has increased in scope and degree. As the President remarked in his address at Dundee, the past year has presented problems of greater difficulty than in any previous period, and every indication foreshadows a growing burden of work and responsibility. However willingly the services of the members of the Executive Council may be given, it must not be overlooked that it consists of busy men whose energies are largely engrossed in their own tasks. In the past the Association has been devotedly served by honorary secretaries who have sacrificed their time unreservedly to its interest. No association has in fact ever been more generously served by its Council and honorary officers; and it must be an encouragement to the new general secretary to know that he has the cordial support of the experienced officers who have preceded him. He is himself a municipal officer of long experience, and he comes to the work admirably equipped in every way to deal with the increasingly difficult problems that will confront the Council in the near future.

A NEW MOTOR FUEL.

Interesting tests have been made in Nottingham before several experts with a new motor fuel, the invention of a South American named Andrade. The fuel is produced by mixing with water a compound known only to the inventor. The test took place in the grounds of Alderman Ball, father of the late Captain Albert Ball, the airman. Alderman Ball has entered into a provisional arrangement with the inventor to secure the European rights.

On some of the liquid being poured on to the ground it burnt steadily and emitted no smoke. The smell does not resemble that of petrol. Half a bucketful of liquid was afterwards poured into the petrol tank of Mr. Ball's car, which travelled with perfect smoothness and at a high rate of speed. More water was then added, and this seemed, if possible, rather to improve the running of the engine. Mr. Ball states that the car travelled over 30 miles on one gallon, and that if Andrade's assertions are true a gallon can be manufactured for 5d. Great interest has been aroused among motor firms by the discovery. Andrade claims that it will prove even more valuable for submarine craft, as practically no air is necessary.

The *Times* says that the inventor has been in this country several weeks, during which time experiments have taken place in the presence of experienced motor experts. It is stated that the inventor claims that by mixing certain chemicals with pure water a liquid is produced which is capable of providing motive power. The chemicals are introduced in the form of powders, and minor experiments which have been carried out are reported to have proved very encouraging. Further tests have yet to be made before the new fuel can be considered to have established the claims of the inventor.

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THE MUNICIPAL TRAMWAYS ASSOCIATION

(INCORPORATED)

Eighteenth Annual Meeting held at Dundee, September 17 and 18, 1919.

The annual conference of the Municipal Tramways Association, which was held at Dundee on September 17 and 18, was in every respect a notably interesting and successful gathering. The meetings were held in the Albert Institute, a handsome municipal building containing a library, museum, and art galleries, and the latter were placed at the disposal of the Association, affording a very attractive and convenient rendezvous. The most complete arrangements had been made by the representatives of the Corporation, and the hospitality extended to the members will long be pleasantly remembered by them. Many of those who attended represented Corporations far distant from Dundee; none of them, it may safely be said, felt that the Association had made any mistake in accepting the cordial invitation that had been extended on behalf of Dundee at the conference in London in 1917. At that time Mr. Peter Fisher, the general manager of Dundee Corporation Tramways, occupied the presidential chair, and in the usual course the conference would have met in Dundee in that year. Owing to conditions prevailing during the war that was, of course, impracticable, but Mr. G. A. Johnston, convener of the Dundee Tramways Committee, and Mr. Peter Fisher secured a promise that on the first possible occasion Dundee should be visited. It was in fulfilment of that promise that Dundee became the locale of the conference for the present year. At the opening session on the Wednesday morning there was a large attendance, representing tramways all over the country. Over 150 delegates from 65 Corporations and local authorities were present when the Lord Provost (Sir William Don, K.B.E.), accompanied by the magistrates, on behalf of Dundee Corporation, extended a cordial welcome to the members, remarking that in Dundee they were aware of the valuable work that the Association had done. The Lord Provost, alluding to the city's tramways, said that they were admittedly one of the most up-to-date systems in the country, and expressed his gratification that the successful work of Mr. Fisher, who had been their manager ever since the Corporation took over the tramways some twenty years ago, had received the recognition of the Association. Mr. G. H. Johnston, convener of the Dundee Tramway Committee, also welcomed the delegates. Mr. T. B. Goodyer, the president of the Association, and Alderman Sir J. W. Courtis, the vice-president, briefly replied, expressing their appreciation of the cordial welcome the delegates had received.

Mr. T. B. Goodyer then took the chair and delivered his presidential address. He began by saying how delighted they all were to meet in the ancient and historic city of Dundee. His year of office, he went on, had been very strenuous but very happy, and he little imagined that when he was elected he should have the unique honour of presiding over the first post-war conference. In achieving the victory tramway undertakings had played no small or unimportant part. In reference to the vital problems with which they had to deal the President said it was pleasing to note that they had arrived at a settlement of some that were causing great anxiety. He was one of those who believed that the tramway situation two or three years hence was likely to cause them some concern, and he ventured to suggest that whilst they should not be unduly pessimistic, they should not by any means take too rosy a view of the immediate future. They had witnessed during the year an important innovation in connection with the transport industry of the country. He referred to the Ministry of Transport. Although the Board of Trade had done good work in the past, he thought that their necessities in the future would be even better looked after under the new administration. Proceeding to deal with "The Problem of London Traffic," the President said he hoped that the question would now be seriously grappled with. Housing and transport in the immediate future were two of the most important matters which would enter into social politics. On the motion of Mr. W. J. Squires (London County Council), seconded by Mr. E. Russell Taylor (Liverpool), a cordial vote of thanks was given to the president for his interesting and able address.

Mr. Peter Fisher (general manager, Dundee Corporation Tramways) then read his paper entitled "Historical Sketch of Dundee," which was much appreciated by the conference.

The address by Councillor Kelly (convener of the Glasgow Corporation Tramways Committee), entitled "Where do we stand?" was listened to with close attention, and it was responsible for a lively and interesting discussion. Councillor Kelly's remarks centred round the questions, "Where do we Stand—Politically, Mechanically, Electrically, Economically, and Traffically?" He examined each of these questions separately, and brought out in the course of a clearly reasoned address many important points. It was absolutely necessary that they should come to some definite understanding as to what was to be their policy in regard to the tramcar. As to the different systems, Councillor Kelly was convinced that the overhead system had still no rival. The question of traffic was coming very much to the front, and many proposals had been made to them for dealing with it, but it was very striking how very impracticable these proposals generally were. His own view was that if the city traffic was generally scientifically regulated, they could use the surface of the street to a much better advantage than they did at present. He was against a municipality running a tramway in order to make a profit to be handed over in relief of rates, but he was also against a tramway becoming a burden of the rates.

Mr. Squires (London County Council), in opening the discussion on Councillor Kelly's paper, said he was glad that he had refrained from laying down hard and fast rules. In dealing with all questions that had been raised it was absolutely necessary to take local conditions and surroundings into consideration, and what they had always to consider was the best interests of the public. Councillor Kelly had ruled out all rivalry to the overhead system, but here again it was necessary to take into account the local circumstances. Until the financial question was solved all other problems must wait.

Mr. Jackson (Liverpool) was not at all pleased with the position which the tramway system in this country occupied, and felt that we had much to learn from other countries. Alderman F. Smith (Liverpool) said he disagreed with Councillor Kelly when he said that the tramways should not make a profit. His view was that the tramways ought to contribute to the rates.

At the adjournment of the morning session the delegates were entertained to luncheon by the Corporation of Dundee.

On the conference being resumed in the afternoon, Alderman W. C. Fenton (Sheffield) criticised the action of the Glasgow Corporation in going to America for rails. He hoped that all tramway undertakings would buy their rails from English manufacturers, and thus help to solve, in some measure, the unemployment problem. Other speakers who took part in the debate were Messrs. Turner (Belfast), Irving (Burnley), Collins (Nottingham), Murray (Walthamstow), Wale (Coventry), West (Walthamstow), and Fryer (Birmingham).

Councillor Kelly, in the course of his reply to the criticisms made by the various speakers, defended the action of his Corporation in going to America for rails, stating that as English manufacturers were unable to give delivery before October they were compelled to buy from America, as the rails were urgently required. "We were without a single rail," he confessed.

In the evening the delegates were entertained at dinner by the Corporation of Dundee, the Lord Provost presiding.

On Thursday morning a meeting of managers was held, when it was unanimously decided to resume the meetings of the managers' section next year at Birmingham.

On the resumption of the conference, Mr. A. R. Fearnley (general manager, Sheffield Corporation Tramways and Motors) read a paper on the subject of "Motor Omnibus Services." Mr. Fearnley dealt with this controversial subject in a manner which was appreciated by all. He said that Sheffield commenced in 1913 to run motor omnibus services on a number of routes within the city and on extensions of their tramway routes outside the city. They had now services covering 37 miles of road, employing altogether about 40 omnibuses. The population of the district served varied from 1,000 up to 22,000. Although he agreed that there was plenty of room for both motor omnibuses and tramcars, yet he thought that those municipalities who had not yet already obtained the necessary powers to work motor omnibuses would be well advised to look closely into the matter at an early date.

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Mr. E. Russell Taylor (Liverpool) opened the discussion. He referred to the great possibilities of the motor omnibuses and to its phenomenal development in the year prior to the war. He believed that at no distant date municipalities would have more omnibuses than trams.

Mr. H. Webber (Keighley), Mr. J. B. Hamilton (Leeds), Messrs. J. Dalrymple (Glasgow), W. Murray (Walthamstow), Monkson (Stockport), Sir J. W. Courtis (Cardiff), A. Baker (Birmingham), R. H. Wilkinson (Bradford), and J. M. McElroy (Manchester) also took part in the discussion.

On the adjournment of the morning session the Association luncheon was held in the Albert Hall, with the president in the chair.

At the annual business meeting on the Thursday afternoon, the report of the Executive Council was approved. The election of officers followed. Sir John W. Courtis, J.P. (chairman, Cardiff Corporation Tramways Committee) was elected president with enthusiastic unanimity, and Mr. C. W. Holford (general manager, Salford Corporation Tramways) was elected vice-president.

An extended report of the proceedings is given in the following pages.

LIST OF DELEGATES PRESENT AT THE ANNUAL CONFERENCE.

Aberdeen	William Forbes, general manager. Bailie Robertson, ex-chairman.
Accrington	Alderman D. C. Dewhurst, Mayor. H. Pilling, general manager.
Belfast	Councillor W. G. Turner, chairman. Councillor J. McDonald, vice-chairman. J. S. D. Moffet, general manager.
Birkenhead	C. Clarke, general manager.
Birmingham	Councillor J. Fryer, member of committee. A. Baker, general manager.
Blackburn	Councillor C. Higham, vice-chairman. J. H. Cowell, general manager.
Blackpool	Councillor H. Brooks, chairman. Councillor T. H. Sergenson, vice-chairman. Charles Furness, general manager.
Bolton	Councillor P. Higson, chairman. Alderman J. R. Russell, member of committee. J. Barnard, general manager.
Bradford	Alderman E. Priestley, chairman. Councillor Akeroyd, deputy chairman. R. H. Wilkinson, general manager. T. Stirk, traffic superintendent.
Brighton	Councillor T. J. Braybon, chairman. William Marsh, engineer and manager.
Burnley	Councillor Edward Heap, chairman. Councillor Dan Irving, M.P., vice-chairman. H. Mozley, general manager.
Burton-on-Trent	A. B. Slater, general manager.
Bury	Alderman T. S. Collinge, chairman. Councillor H. Hargreaves, deputy chairman. F. Buckley, general manager.
Cardiff	Alderman Sir John W. Courtis, chairman. A. Ellis, manager.
Chester	W. H. Ellis, manager.
Coventry	Councillor H. W. Wale, chairman. Councillor J. Grant, vice-chairman. T. R. Whitehead, general manager and engineer.
Croydon	Councillor A. A. Thomson, chairman. T. B. Goodyer, general manager.
Darwen	G. A. Newsome, general manager.
Doncaster	E. S. Rayner, manager.
Dundee	G. A. Johnston, convener. Bailie Buist, member of committee. Peter Fisher, general manager.
East Ham	Alderman O.R.Anstead, member of Committee. W. C. Ullmann, engineer and manager.
Edinburgh	Councillor John Harrison, chairman. R. S. Pilcher, general manager.
Erith	Councillor G. C. Humphrey, chairman. John C. Williams, manager.
Exeter	R. O. Baldwin, general manager.
Glasgow	Councillor Thomas Kelly, convener. Councillor John M'Whirr, vice-chairman. J. Dalrymple, general manager.
Halifax	Alderman Fawcett, vice-chairman. Councillor J. A. J. Crossley, member of Committee. J. Calloway, tramways engineer. Jas. D. Caird, traffic manager.
Huddersfield	Councillor Sellers, chairman. Councillor Mitchell, member of committee. A. A. Blackburn, general manager.
Ilford	L. E. Harvey, manager. Councillor H. G. Odell.
Keighley	Councillor Albert Smith, chairman. Councillor Jas. G. Ambler, deputy chairman. Harry Webber, manager.
Lancaster	Councillor T. Wilkinson, chairman. Geo. C. Milnes, engineer.
Leeds	Alderman R. A. Smithson, chairman. Alderman Herbert Brown, J.P., deputy chairman. J. B. Hamilton, general manager.
Leith	F. A. Fitzpayne, general manager.
Leyton	Alderman T. P. Haines, chairman. F. Schofield, general manager.
Liverpool	Alderman R. Russell Taylor, chairman. Alderman F. Smith, vice-chairman. Councillor David Jackson, member of committee. G. H. Naylor, member of committee. P. Priestly, deputy general manager.
London C.C.	Councillor W. J. Squires, chairman.
Lowestoft	H. H. Saunders, manager.
Manchester	Alderman James Bowes, chairman. Dr. A. W. Chapman, deputy chairman. J. M. McElroy, general manager.
Newcastle-on-Tyne	Councillor R. Mayne, chairman. Alderman A. Wilson, member of committee. E. Hatton, general manager.
Newport (Mon.)	N. J. Young, general manager.
Northampton	John F. Cameron, general manager.
Nottingham	Councillor Chas. Coggan, member of committee. John Aldworth, manager.
Oldham	Councillor Jas. K. Cheetham, chairman. W. Chamberlain, general manager.
Perth	Councillor Jas. Calderwood, convener. Bailie John Moncrieff, member of committee. W. G. Snell, general manager.
Plymouth	Councillor J. Moon, vice-chairman. C. R. Everson, general manager.
Portsmouth	Councillor John Timpson, chairman. Councillor Walter Gleave, deputy chairman. W. R. Spaven, general manager.
Preston	Councillor T. Parkinson, vice-chairman. J. F. Simpson, manager.
Rawtenstall	C. L. E. Stewart, general manager.
Reading	J. M. Calder, chief assistant engineer.
Rochdale	Alderman James Taylor, chairman. Alderman H. Clark, member of committee. Geo. Webster, general manager.
Salford	Alderman H. Linsley, chairman. G. W. Holford, general manager.
Sheffield	Alderman W. C. Fenton, deputy chairman. Alderman J. Knowles, member of committee. A. R. Fearnley, general manager.
Southampton	Alderman F. A. Dunsford, chairman. J. Dobson, general manager.
Southport	Councillor Clayton, chairman. Councillor Richardson, vice-chairman. T. J. Kendrew, general manager.
South Shields	Alderman W. G. Wylie, chairman. Councillor John G. Winskell, deputy chairman. J. C. Whiteley, manager.
Stalybridge, Hyde, Mossley, and Dukinfield	Councillor S. C. Homer, deputy chairman. Frank Schofield, manager.
St. Helens	Councillor A. Rudd, chairman. Councillor Thos. Abbott, vice-chairman. L. C. F Bellamy, general manager.
Stockport	Councillor T. W. Potts, chairman. A. T. Eardley, general manager.
Sunderland	Alderman Geo. New, chairman. Councillor Wm. Walker, deputy chairman. A. R. Dayson, general manager.
Wallasey	Councillor H. W. Griffin, deputy chairman. R. R. Greene, general manager.
Walsall	Alderman Jabez Cope, chairman. Alderman John Williams, vice-chairman. Councillor M. J. Somerfield, member of committee. Ald. Walker, member of committee. R. L. Horsfield, general manager.
Walthamstow U.D.C.	Councillor J. W. West, chairman. Wm. Murray, general manager.
Warrington	Councillor D. Plinston. J. Telfer, general manager.
West Ham	Councillor G. Croot, chairman. Councillor E. W. Wordley, Mayor. L. Slattery, general manager.
West Hartlepool	Alderman R. Martin, chairman. C. Burgess, general manager.
Wigan	Councillor Walkden, vice-chairman.
Wolverhampton	C. O. Silvers, general manager.

The Tramways and Light Railways Association was represented by Major F. Coutts, general manager, Paisley Corporation Tramways.

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OPENING SESSION.

RECEPTION BY THE LORD PROVOST OF DUNDEE.

The eighteenth annual meeting of the Municipal Tramways Association (Incorporated) was opened on Wednesday morning, September 17, in the Victoria Art Galleries, Dundee, when the members and delegates were received by

The Lord Provost (Sir William Don, K.B.E.), who said :—Ladies and gentlemen, it gives me the very greatest pleasure on behalf of my fellow magistrates and councillors to accord to the members of the Municipal Tramways Association throughout the country a very hearty welcome to our ancient city. But for the war the probability is that we should have had this opportunity some years

The Lord Provost of Dundee
(SIR WILLIAM DON, K.B.E.).

ago, when our respected engineer, Mr. Fisher, was president of your Association. (Applause.) We in Dundee appreciate exceedingly the great compliment paid to Mr. Fisher, who has been our manager since the Corporation took over the tramway system some twenty years ago, and we are pleased to think that the success with which he has carried on his work, and the estimation in which he is held in tramway circles, merited your recognition.

It is some five or six years since such a conference as this was held. During that time a great world war has been fought. Truth, justice, and righteousness have been vindicated, and victory and peace—let me say we hope a lasting peace—has been secured. (Applause.) We now feel that the time has come when the great social and business problems which have been held in abeyance or dealt with in a makeshift fashion now lie open for calm discussion and settlement. You, gentlemen, have met here to-day to deliberate and to formulate schemes which shall be to your mutual advantage in the tramway world. Permit me to say that I think Dundee is a particularly appropriate centre to meet. Our tramway system, though not so extensive as that found in some of the large cities, is admittedly one of the most up-to-date systems in the country. The current is generated by the Municipal Electricity Department at a comparatively cheap rate. We have in Dundee what is admittedly one of the most efficient electrical stations in the country, and I am giving away no secrets when I say that the thermal efficiency of our station is the second best in the kingdom, and therefore I hope that those of you who are interested in this department will take an opportunity when here of visiting our electrical station. At the present moment we are considering a water-power generating scheme with far-reaching possibilities. It may not be known to most of you here that Dundee was the home of the great scientist and electrician, James Bowman Lindsay. Lindsay is said to have been the first to have formulated a practical scheme for laying an Atlantic cable. He also was the first, I believe, to produce continuous electric light, and undoubtedly he was amongst the first, if not the first, to produce wireless telegraphy. Many of you will no doubt take a trip on the river—such a trip has been provided for on Friday—and it will perhaps interest you to know that nearly a century ago Bowman Lindsay successfully sent wireless telegrams across the River Tay. At the same time, we hope that at this conference you will not take business too seriously. The Tramways Committee, with its able convener (Mr. G. A. Johnston) have arranged what I believe with suitable weather you will find to be a very profitable and beneficial outing. We hope that you may see something of our great industries—our jute industry, our marmalade industry, and something of our engineering and shipbuilding establishments, and at the same time we hope that you will not confine yourselves to these, but may go away from our city with pleasant recollections of the beautiful surroundings and scenery in this neighbourhood. I believe the Tramways Committee have given as much consideration to this as they have to the business part of the programme. I have no doubt that with plenty of fresh air you will acquire good appetites, and I believe that they have provided for nature's wants. (Laughter.) On behalf of the city of Dundee, allow me to say once more how delighted I am to have you with us this morning, and I do extend to you a most hearty welcome. (Applause.)

Mr. G. A. Johnston (convener, Dundee Corporation Tramways Committee).—As chairman of the Dundee Tramways Committee, it gives me very great pleasure to associate myself with the sentiments voiced by Lord Provost Sir Wm. Don, in his welcome to you this morning. It is due to the Lord Provost to say that he has shown the greatest anxiety that our arrangements should be worthy of Dundee. We in Dundee know the valuable work which the Municipal Tramways Association have done in safeguarding the public interests and in promoting tramway progress, and I am sure your meeting in Dundee will be no exception to this rule. I extend to you a very hearty welcome, and we wish you every success in your good work, and that you will all have a very pleasant time, the remembrance of which may linger long with you.

Mr. T. B. Goodyer (manager, Croydon Corporation Tramways).—My Lord Provost, Convener Johnston, and ladies and gentlemen, I am quite sure that I am voicing the sentiments of every representative of the Municipal Tramways Association present when I say that we appreciate very much the hearty reception accorded to us this morning by Lord Provost Sir Wm. Don and Convener Johnston. I am sure that when we go away from Dundee we shall all take with us feelings of gratitude for all that they have done for us.

Mr. G. A. Johnston,
Convener, Dundee Tramways Committee.

A vote of thanks to the Lord Provost and Convener Johnston was submitted, and carried with acclamation.

Alderman Sir J. W. Courtis, J.P. (chairman, Cardiff Corporation Tramways Committee).—My Lord Provost, members of the Dundee Corporation, ladies and gentlemen, I do not think it is usual for the vice-president to follow his president in expressing our appreciation

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of the welcome such as we have received. But I have been asked to do so, and I will only very briefly say how much we all appreciate the very kind welcome you have given us as members of the Municipal Tramways Association. You have told us many of the things that we shall see in Dundee, and I am quite satisfied that we shall spend a very interesting time. We all know what Dundee is famous for, and we shall certainly not take business too seriously. As many of the members have brought their wives—and families, I think—(laughter)—I feel sure that if the matter is left to them they will follow your injunction, and not be too serious, but will see to it that they have time to see some of the beauties of your town and district.

The Lord Provost.—We will now leave the meeting in the hands of the Association.

PRESIDENTIAL ADDRESS.

By T. B. GOODYER, A.I.E.E.

(*Tramways Manager Croydon Corporation Tramways*).

Gentlemen—In the first place, let me say how delighted I am to meet you in this ancient and historic city of Dundee. I am, personally, indebted to the Lord Provost, Magistrates, and Town Council of Dundee for their kindness in inviting us to hold our annual conference this year in their city. I can assure them that the association of my year of office and the name of Dundee will remain a happy memory throughout my life.

When I accepted the honour which you conferred upon me at Leicester last year, in electing me to the position of President of this important Association, I did so with some hesitancy, feeling that the responsibilities I was about to undertake were of a heavy character, but I hoped that, with the cordial support of the members of the Executive Council and the honorary officials, I might justify your selection.

My year of office, although very strenuous, has been a happy one. I did not imagine when you elected me last year that I should have the unique honour of presiding over the post-war conference, and that my term of office would see the end of the war and the victory of the Allies. We have passed through many dark hours of trouble during these years; many of our members have lost those dear to them, and many of our employees also have paid the great sacrifice to save our Empire from destruction. To the relatives of each and all I tender my sincere condolence, and, on behalf of the Association, our grateful thanks for all that they have done on our behalf.

In achieving victory, tramway undertakings have played no small or unimportant part. Many of them have been engaged in the production of munitions in the huge quantities that were required for our naval forces and for the magnificent armies of the British Empire and of our Allies, whilst they have also provided special and greatly increased transit facilities, involving in some instances considerable capital expenditure, for those engaged in war work. They have not, however—as has another transport undertaking in the metropolitan area—been subsidised by Government funds.

In the early months of my year of office the clouds began to disappear, and before its termination the peace terms of the Allies had been signed, and the military sky is bright once more.

Not only has the conclusion of the war formed an important feature during the past twelve months, but we, as an Association, have had to deal with matters affecting our industry of a most vital and important character. In referring to them I am pleased to say that we have arrived at a settlement of some of the problems which caused us at the time grave anxiety. I will refer principally to two of these:—First, the application of the National Transport Workers' Federation for reduced working hours and variations in conditions of labour. Although this subject will be dealt with at greater length in the report of the Executive Council, I can speak from personal experience in saying that every credit is due to those tramway representatives who had to carry out the negotiations with the various parties interested, and who arrived at an agreement which—although it might appear to be of an involved character—in some respects has, for the first time in our history of tramway working, fixed conditions of service which were applicable to the whole of the undertakings in the country. Whilst it is obvious that the revised conditions of the operating staffs will entail a considerable increase in working costs, I think it will be agreed that we have, as employers, the right to look in return for increased efficiency on the part of the workers concerned.

All tramway systems, whether large or small, are a convenience to the residents of the districts through which they run; and the owners, be they ratepayers or shareholders, are entitled to their share of the benefits, and those using the cars should be willing to pay such fares as will give a reasonable return upon the capital invested.

Charges for all public services—railways, postal, and telegraph—have been materially increased, and in view of the better circumstances of the classes forming the bulk of our tramway passengers, I think it may fairly be said that any revisions of fares which it has been necessary to make—and they are less in magnitude than those of railways—are more than justified, while many others are already overdue. In this connection it is interesting to observe the remarks of Lord Sumner's Committee (Working Classes, Cost of Living, 1918), issued on October 23, 1918. In commenting upon the "details of domestic expenditure on items other than food," they say:—

> "With regard to tram fares, we have received replies from 43 towns to our inquiry whether the local fare per mile had increased. In workmen's fares we find that there has been no increase in 25 of the towns; the increases in the remaining 18 have been insignificant, never exceeding ½d. per mile. To mark the small increase in tram fares in some towns, expenditure on fares in 1914 is taken at 2d. (per week) less than the expenditure given for the 1918 budgets."

In the matter of fares, I trust it will not be out of place if I quote the view so clearly expressed by Mr. John Young in his presidential address at Glasgow, in 1902, when he said:—

> "Municipal tramways differ as properties in so many respects that the same practice cannot apply to all. Even in the all-important matter of fares, what can be done judiciously and profitably in one case cannot be done in another, and it is well for each Corporation to study their own views, and feel their own way, before making concessions which they may not be able to live up to. It is difficult to go back. The success of municipal tramways depends on a variety of circumstances. There is, however, one common essential to the success of such commercial undertakings, and that is that they must be managed on pure business principles."

I hope I am expressing your views, as well as my own, when I say, having regard to our financial obligations now and in comparison with what they were in pre-war days, that Mr. Young's opinion deserves, to-day, the most serious consideration of everyone concerned in the control of our undertakings.

I am one of those who believe that the tramway situation two or three years hence is likely to cause us some concern, when there is less money to spend on fares, and when operating expenditure will not be much less than just now. I venture to suggest therefore whilst we should not be unduly pessimistic, we should not by any means take too rosy a view of the immediate future.

The second subject which I desire to refer to is the formation of the Joint Industrial Council for the Tramway Industry. This also entailed an enormous amount of labour upon the Executive Council, and it was a matter of considerable satisfaction to me when we met in London in May last to have the constitution endorsed with a few minor amendments. When we consider that we have to deal with corporate bodies numbering nearly 100—and where varied opinions are held—it is, I submit, a matter for congratulation that finally we can arrive at a common basis of agreement.

We have also witnessed during the year an important innovation in connection with the transport industry of this country. I refer to the Ministry of Transport Bill, and I felt proud, and I am sure each one of you felt equally so, when you read the words of Sir Eric Geddes in introducing the Bill for the first time in the House of Commons. I think they are worthy of repetition here, and I ask your indulgence whilst I read the following extracts from the House of Commons Debates for the dates mentioned. On March 17, 1919, Sir Eric spoke as follows:—

> "Except in the one bright instance of the municipal tramways, the transportation systems of this country to-day are not prosperous. I will go into details later, but, briefly, this is the position: There are 279 tramway undertakings in the country, of which 96 per cent. are electrified. That is an important point. . . . It shows that these undertakings are almost entirely modern. Taken all over, these undertakings are earning 7 per cent. on their capital. They are excluded from the Bill."

On April 8, 1919, Sir Eric moved an amendment: To leave out the word "tramway," and insert instead thereof the words "or tramway, other than a tramway or light railway used as a tramway and belonging to a local authority," and stated that the amendment was not put down because they, the new Ministry, had been "got at."

> "The tramways were excluded from the compulsory powers under Clause 4 in the Bill, as originally drafted, and it is only to make that point clearer that, now that Clause 4 has gone, the proposed amendment is brought forward. The reason for the exclusion of the tramways was that the Government did not wish to be accused of taking over highly prosperous and remunerative undertakings, which were essentially the property of the community, and it was thought that with a State Department running the transportation system, and with the progressive municipalities who worked these very modernly-equipped undertakings, it was unnecessary to disturb the existing proprietorship. That is the reason why they were excluded."

We were apprehensive, in the first instance, that municipal tramways undertakings would be seriously interfered with, but it will be observed from the words I have quoted that the Ministry have no intention of taking over the working of our tramways.

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Although the Board of Trade have done good work in the past, we look forward, with some degree of hope, I venture to think, that our necessities in the future will be even better looked after under the new administration.

The recently issued report of the Select Committee on Transport (Metropolitan area) recommends the setting up of a "Supreme Traffic Board for Greater London, possessing executive powers to control, co-ordinate and initiate, and to safeguard and further public interests."

It is greatly to be regretted, in spite of the exhaustive reports which Royal Commissions and Select Committees have made in the past, that such a Board has not been set up previously. No doubt the reason is due to "other" interests blocking the way. It is to be hoped, however, that the problem of London traffic (which has many different phases in comparison with the conditions prevailing in other parts of the country, and which have been previously reviewed at considerable length by our past metropolitan presidents) will now be seriously grappled with. The Board will accomplish much if it secures, to quote the Committee, "avoidance of senseless and costly competition." The view is generally entertained that the competition with the municipal tramways undertakings, except during the period of the war, has been "aggressive" in character.

The Select Committee condemned the inequitable rating of tramways, and their contribution towards the maintenance of the surface of the roads, as compared with the immunity of the omnibuses from both these charges.

The special report of the Local Legislation Committee of last session refers to the anomaly of the compulsion upon municipalities to contribute to the upkeep and the cost of reconstruction of roads and the immunity of private enterprise therefrom, especially so far as motor omnibuses are concerned. This question, and the allied subject of rating of tramways, have recently occupied the attention of the Tramways Committee of the London County Council. They are both subjects that are ripe for reconsideration. It must be conceded that there is no analogy between a railway, used solely as such, and a tramway laid in a street which is used in common with every other kind of traffic. The conditions that prevailed in 1870 have long since passed away. During the past 49 years we have passed through three distinct stages in tramway development—as distinct as the stages in geology—and yet we are tied down to the conditions of 1870. The stages are:—

(1) From 1870 to 1879, the "Horse Period." Manifestly there was something to be said for the obligation then placed upon tramway undertakings to maintain roads, so far as the paving between the rails was concerned, when they bore the wear and tear caused by the constant tramp of horses' feet; but now, not a single sett is in any way used by tramways rolling stock.

(2) The "Steam Period" extended from 1879 to 1898; and

(3) From 1898 we have the "Electricity Period."

I am not without hope that these two questions that vitally concern the well-being of tramway undertakings will receive serious consideration in the immediate future.

The Committee commented upon the total "lack of reliable information and useful data in the possession of any of the Government Departments," or of the transportation agencies, for the purpose of arriving at a correct conception of the "science of movement" in a great area like that of the Metropolis.

This conference may be interested to know that learned societies for the study of such problems exist in America, whilst some have their scientifically-arranged traffic museums. In this connection, as we are all engaged in the work of transportation, I feel sure we shall heartily support the views enunciated by "Modern Transport" in its advocacy of the foundation of an institution devoted to the study of traffic and transport, so that we may be able to follow the clearer conception of the principles which underly the development of traffic, and the relative economies underlying the various manifestations it assumes, and thus be the better able to discharge our duties.

Housing and transport in the immediate future are two of the most important matters which will enter into social politics, and in this connection it can be asserted with truth that tramways especially (and also railless traction and motor omnibuses) will play a most important part in the new social life and development which is about to be inaugurated in linking up new housing areas with industrial towns.

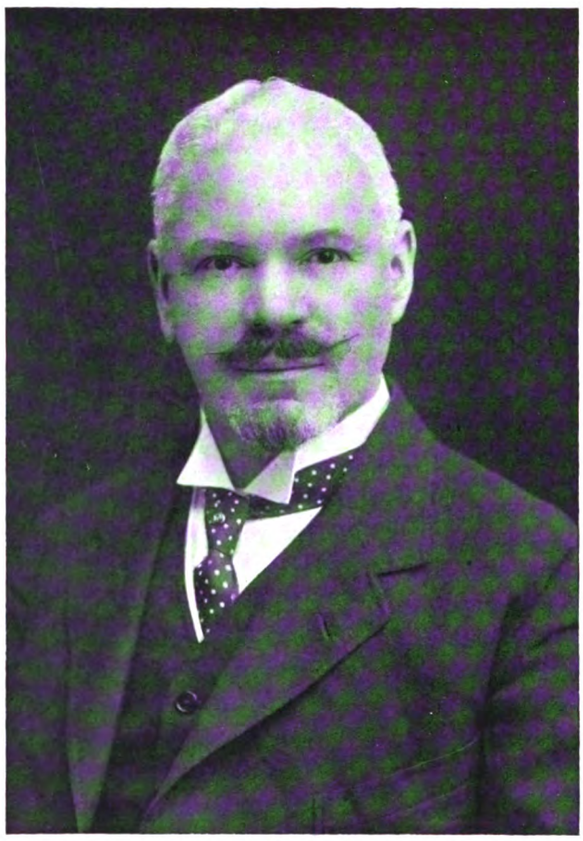
It will not be out of place if I here quote the following extract from the report of the Select Committee on Motor Traffic, which was issued some years ago:—

> "Your Committee are of opinion that what is required is a new arrangement of the functions of Government Departments, and for all matters of a municipal character the concentration of power and responsibility upon existing central authorities. The latter must eventually be the paymasters; they are in contact with the ratepayers, and are in daily touch with changing conditions.
>
> "The duty of originating and accommodating traffic schemes and regulations is, in the opinion of your committee, a municipal duty. The control of the streets is essentially a municipal function, and the same minds should have before them the question of the adequacy of the street facilities for traffic and its regulation, and the safety and convenience of pedestrians."

Lord Islington, speaking in the House of Lords on Thursday, July 31 last, on the Ministry of Transport Bill, stated:—

"Rapid, regular, and cheap tramway facilities are an integral and indispensable part of a successful housing scheme."

The various points I have just referred to will, I feel sure, have the earnest consideration of our municipalities in any new housing schemes which they propose carrying out.



Mr. T. B. Goodyer,
President of the Municipal Tramways Association, 1918-19.

My predecessor in office, Mr. Alderman Flint, at Leicester, referred to the ever-increasing work which was entailed upon the honorary secretary, and the desirability of making suitable and adequate arrangements for the future carrying out of the duties of that office. I think that even his anticipations of the increased work have been exceeded, and the Executive Council, with your authority, have deemed it necessary to appoint a paid officer for this work, and I have pleasure in welcoming the new General Secretary to his first conference of our Association. I trust that he may find the duties of his office of an interesting character, and that his services will prove of great value to us. I need hardly assure him that the Executive Council will willingly assist him in carrying out those duties.

I have to congratulate the members upon the completion of another year's successful working of the Association, and of its usefulness as shown by the large variety of subjects which have been dealt with during that period, but I will not occupy your time in referring to them, as they are set forth in detail in the annual report of the Executive Council.

There can be no question, I think, that the twelve months terminating with this conference will rank in the annals of the Association as the busiest, most strenuous, and most important year in its existence. Members will gain from a perusal of the annual report some idea of the many important matters that have claimed the attention of your Executive Council. One needs to be a member of the Council, however, to realise to the full extent the magnitude of the work accomplished.

Before concluding, I desire to express my thanks to the vice-president, Sir John Courtis, for the great help he has always been willing to render to me in the fulfilment of my duties; to the members of the Executive Council for the most loyal support they have extended to me on all occasions; to Mr. W. Clough, who acted as honorary secretary during the first period of my office, and who

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performed his duties in an exemplary manner; and to Mr. Holford, for his splendid services so ungrudgingly given, and for the valuable advice and assistance which he has always been willing to place at my disposal. I am expressing the views of the Executive Council when I say that the Association is deeply indebted to Mr. Holford for taking over the onerous and exacting duties of the office he has so efficiently carried out, when the work of the Association has been at its heaviest. My thanks also are due to our honorary treasurer, Mr. Fearnley, for the help he has always willingly rendered me.

I am also indebted to the members of our sister association—the Tramways and Light Railways Association—for the courtesy they have shown on every occasion when we have had to confer jointly on matters of common interest, and likewise to the representatives of the employees' organisations for the fair and broad-minded manner in which they have discussed with us the many negotiations affecting our industry.

In wishing the Association continued success and prosperity in the years to come, I hope the conference of 1919 will be remembered as the most instructive and enjoyable held for many years. I am sure we could not meet in more delightful surroundings. I express the hope that we shall have a successful conference, and that our deliberations will be of interest and utility both to the delegates and the municipalities they represent.

Mr. W. J. Squires (chairman, Highways Committee, London County Council Tramways).—Mr. President, ladies and gentlemen, I have been asked to move a vote of thanks to the President for the very able address which he has just read to the conference. I think his address shows a great deal of thought, and will provide excellent food for discussion in the future. I understand that no discussion can arise out of the president's address, but no conference, I feel sure, could have the privilege of listening to so valuable a presidential address without wishing to have its very best thanks tendered to him as a mark of its appreciation. (Applause.)

Alderman E. Russell Taylor (chairman, Liverpool Corporation Tramways Committee).—I have the greatest possible pleasure in seconding that.—The motion was carried unanimously.

The President.—I thank you all for the kind way in which you have received my paper. Let me say how very glad I am that the President's address is not a subject for discussion. I have now very great pleasure in calling upon Mr. Peter Fisher (general manager, Dundee Corporation Tramways) to give us his paper on "A Short History of the City of Dundee."

SHEFFIELD STRIKE SETTLEMENT.

Mr. J. Beckett (general secretary of the Municipal Tramways Association) at this stage announced the receipt of the following telegram from Sheffield:—"Committee gave men twenty-four hours to resume work, and declined further negotiations. Men have held meetings and decided to resume work on Wednesday morning (September 17) on old terms."

HISTORICAL SKETCH OF DUNDEE.

By Peter Fisher
(General Manager, Corporation Tramways, Dundee).

The early history of Dundee as an organised burgh, with laws administered by a municipal governing body, can be traced continuously upon documentary evidence from the time of Malcolm III., called Canmore, who was King of Scotland from 1057 till 1093, and whose wife, St. Margaret, was commemorated by an altar dedicated to her in the Church of St. Mary of Dundee. It has therefore had a corporate existence for nearly nine centuries. But one has to look further back for the origin of the burgh. Positive proof has been discovered that long before the Roman Invasion in 55 B.C. there was a primitive fishing village at the Stannergate, on the shore of the Firth of Tay, in which may be found the beginnings of the modern city.

Passing over the misty period that lies between pre-historic times and the date of recorded history, Dundee is found about 1050 to have a definite existence, and it was then so important that tradition asserts that King Malcolm Canmore had a residence there. A century later King William the Lion, who ascended the throne in 1165, held the burgh as a royal possession, the feus of houses in the burgh being granted by the King.

Centre Pole Construction in Dundee.

The shipping and commercial history of Dundee can be traced back for a very long period. That the burgh was a shipping centre is proved by the fact that the first church in Dundee, which was in existence about 1100, was dedicated to St. Clement, the patron saint of seamen.

From existing documents it is seen that in 1225 and 1264 Dundee was the principal port north of the Forth that traded with France, Spain, and Holland at a time when Scottish commerce with these countries was limited. To trace the gradual development of the harbour from the primitive landing-place of early times to the magnificent series of docks required for modern traffic would be to write the narrative of the growth of the burgh. Necessarily, a harbour so well situated topographically made it a coveted point in time of war, and thus Dundee had a large share in the national history of Scotland. Here the invading fleets of England repeatedly entered, and here they were as frequently repulsed; and this story of attack and defeat was continued until the Crowns of Scotland and England were united in 1603 under James I. of Great Britain. The extent of the harbour in 1651, when Dundee was captured by General Monck, may be judged by the statement that there were sixty ships taken in the harbour, many of them containing the property of Scottish nobles brought there for safety.

No definite date can be given for the establishment of local government in Dundee, but documents of the twelfth century refer to "burgesses," so the community must have been regularly ruled

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by men of mark in those remote days. A continuous list has been compiled of Provosts and ruling Bailies in Dundee from 1286 till the present day, so that there have been at least seven centuries of civic government in the burgh. The Town Councils have passed through many vicissitudes in that long stretch of time, but the idea of progress has always ruled. The marvellous nineteenth century, with its advancement in every department of civic and industrial life, affected Dundee, as it did every other progressive city. At length in 1889 Queen Victoria granted a Royal Charter elevating Dundee to the rank of a city, and in 1892 a Royal Warrant was issued decreeing that " for all time coming the chief magistrate of Dundee shall be known by the style and title of Lord Provost."

For many years Dundee has maintained its position as third city in Scotland as regards population and second in commercial importance. Its progress in population has been unbroken for over a century, and in this connection it may be pointed out that whereas in 1867 its inhabitants numbered 104,000, the population of the city is now estimated at 182,000.

Undoubtedly the great factor in the rapid rise of the population of Dundee was the jute industry. By laying hold of this commodity in the early stage of its development a practical monopoly of a world-wide demand was secured. About the middle of last century the city may be said to have advanced by leaps and bounds, and a huge increase in the population took place.

Prior to 1913, when the city boundaries were extended to include the burgh of Broughty Ferry and part of the county, the total population of Dundee stood at over 165,000. By the inclusion of that burgh and part of the county an additional population of between 12,000 and 14,000 was added.

An increase in population is not the sole indication of progress. Few cities occupy such a handsome natural situation, and I hope the members of the Municipal Tramways Association will get demonstration of this when, after the conference labours are over, they take advantage of their sojourn in these parts of the sail on our beautiful river arranged for Friday. That excursion will supply proof of Dundee's importance as a seaport, and give evidence of the potentialities existing for the development of the city from a shipping point of view. Meantime, let me say that direct communication has for long been provided with many ports in England and Ireland and the Continent, and the great jute-laden vessels from India form an asset of immense value.

Some years ago Dundee Harbour was created a naval base, and the waters of the Tay utilised as an anchorage for submarine craft. This has aroused further interest in the port itself, and brought the city into the focus of certain present-day importance.

Mr. Peter Fisher,
General Manager, Dundee Corporation Tramways.

The city's government has been marked by courage and enterprise. Gas, water, electricity, and tramways are owned by the Corporation, and dating from the Improvement Act of 1871 a large part of Dundee has been re-created—narrow wynds having given place to broad boulevards, and erstwhile congested areas becoming wholesome open spaces. The city boundaries now comprise 6,548 acres, exclusive of foreshore, and include 745 streets and roads, the total length of which exceeds 123 miles.

Recently much attention has been bestowed on the public health and sanitary conditions. The death-rate in 1917 was 14·10 per 1,000 of the population. Fifty years ago the death-rate was 32 per 1,000.

Amongst contributory causes to this important state of matters may be mentioned :—

(1) The magnificent and almost unlimited water supply—the present daily consumption being over 11 million gallons.

(2) The complete and splendidly-equipped series of public baths and wash-houses planted in every district of the city—the aggregate yearly bathers being 240,898 and those using the wash-houses 334,010.

(3) The enlightened methods applied to the cleansing of the city.

(4) The general supervision by the Medical Officer of Health, whose staff includes lady health visitors charged with the duties of systematic visitation of the houses in the poorer districts with the view of directing attention to the dangers of dirt and darkness and the virtues of domestic and personal cleanliness.

(5) The fuller knowledge and higher tone in regard to matters of hygiene in nearly every class of the community.

Alongside the important health conditions of the people may be placed the increased valuation of the city, exclusive of churches, schools, and similar non-assessable subjects. The assessable value of the city in 1867 was £306,504, as compared with £1,084,683 for the present year.

An indispensable adjunct to all great cities is a system of tramways, and the tramway department of Dundee is one of the most important of its municipal undertakings. There are 16½ street miles of track covering all the important central and main arteries of the city. The topographical situation of the city, however, is such that it cannot be said that it is anything like an ideal town for tramways, Some of the most densely-populated parts being inaccessible on account of the steep gradients and narrow streets. In spite of this the population served by the tramways is carried over 150 times per annum, and the financial position might be considered satisfactory. The total capital expenditure is £384,788 ; £128,569 has been repaid by the application of the sinking fund, and the reserve and renewal funds amount to £117,229.

Notable amongst the amenities of Dundee are its public parks and open spaces. In most of the parks there are well-equipped bowling greens, and in three of the parks there have also been erected tennis courts, which are exceedingly popular.

The Caird Park, extending to 278 acres of historic and romantic scenery, was gifted to Dundee by the late Sir James K. Caird, and when this handsome park is fully laid out there will be a complete golf course actually within the city's boundaries.

Comparatively few people have the privilege of University education, but where there are books there is a University in the real sense, and this is where Dundee scores. Perhaps nowhere has the Free Library been better developed than in Dundee, which has the distinction of being the first city in Scotland to adopt the Free Libraries Act. Besides the parent institution in the Albert Institute, there are seven branch establishments, all of which are distinct ornaments to the city. The general catalogue contains 174,133 volumes. Our worthy librarian, Dr. A. H. Millar, is continually adding to the attractiveness of the Free Library and Museum which are under his control. Moreover, at University College full courses are provided leading to degrees in arts, science, and medicine, and quite recently one of our young and energetic merchant princes, Mr. George Bonar, gifted £25,000 for the establishment of a Chair of Commerce at the College. It may be said that there are few human activities unrepresented in Dundee. Nor have the inhabitants failed to be touched to the finer issues.

Philanthropy and benevolence take full advantage of an ample field. The ameliorative agencies that work in the city are manifold, and to show you that this side of Dundee's activity is paramount, even in war time, I may here repeat what the Lord Provost said at the luncheon given to Earl Beatty when he visited Dundee this month that Dundee contributed to the Royal Navy no less than 6,000 tons of vegetables, representing one-thirtieth of all the contributions of that kind from the United Kingdom.

From what I have said I think the members of the Municipal Tramways Association will conclude that in accepting the invitation to hold their annual conference in Dundee they have come to no mean city.

Councillor R. Mayne (chairman, Newcastle Corporation Tramways Committee).—I have much pleasure in proposing that we accord our thanks to Mr. Fisher for the paper he has read to us. It is quite an education to have given to us a geographical and historical account of the place we are visiting. Last year at Leicester I know many of us found out a great deal that we did not know before, and this morning we have learned much about Dundee. I have much pleasure in moving a hearty vote of thanks to Mr. Fisher.

Alderman H. Brown (vice-chairman, Leeds City Tramways Committee).—I am delighted to be able to second this resolution to Mr. Fisher. I have known Mr. Fisher many years, but it is only this morning that I have learned more of his virtues. I was in company this morning with several gentlemen, two or three of whom were fellow Scots, and one of them had anticipated the Lord Provost's remarks, because he said that he was particularly anxious to combine business with pleasure, and that he was hoping to be able to get a round or two of golf. Unfortunately, however, he had

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no golf clubs, but a Scotchman who was there said that there was one man in Dundee to whom you will pay the highest compliment if only you ask him for something he has not got. The greatest compliment you will be able to pay Mr. Fisher, I said, is to ask him for some golf clubs, because I know he has not got them, but he will find them; and when the question was put to Mr. Fisher he said he could find not merely one set but half a dozen if necessary. Mr. Fisher possesses some of the qualities which make Scotchmen so attractive, for he is always genial and interesting, and we are delighted to accord to him our thanks for the very concise matter which he has put before us with regard to the ancient city whose hospitality we are enjoying.

The resolution was submitted and carried.

The President.—I should like to extend a hearty welcome to the members of the Tramways and Light Railways Association, and also to our other visitors, some of whom are here for the first time. We hope that they will all take part in the discussions which are to follow. I will now ask Bailie Kelly, of Glasgow, to favour us by the reading of his address, "Where Do We Stand?" which is a subject of great importance.

WHERE DO WE STAND?

AN ADDRESS by COUNCILLOR KELLY

(*Convener of Glasgow Corporation Tramways Committee*).

Having been requested by your President to prepare a few notes on some subject of general interest for this conference, I readily consented to do so. I presume that I was asked to appear before you to-day because I am a chairman, or, as we say in Scotland, convener, of a Tramways Committee. I considered that, as you have decided to honour a Scottish city with your presence and particularly a city so far north as Dundee, it was my duty to accede to your President's wish.

During the past five years the tramway industry has been carried on under great difficulties. All our ingenuity and our energy have been expended in keeping the car wheels revolving. There have been very few extensions made in any direction, and I am afraid the introduction of new and improved methods has had to be altogether neglected.

I am constrained therefore at this time to ask the question, and to induce every tramway man present to ask the question—where do we stand? I think it is up to us who are at the moment responsible for the management of the municipal tramway undertakings of the country not only to ask this question, but also to answer it, and to make whatever plans may be necessary to ensure that our tramway systems are placed on a thoroughly sound footing, and are carried on in the most efficient way.

I began these notes by putting the general question to you, "Where do we stand?" I now ask you to reply to a few particular questions:—

(1) Where do we stand politically?
(2) Where do we stand mechanically?
(3) Where do we stand electrically?
(4) Where do we stand economically?
(5) Where do we stand "traffically"?

Perhaps I may not have placed these queries exactly in their proper order, but that is not of much consequence.

WHERE DO WE STAND POLITICALLY?

In regard to the first, it is now absolutely necessary that we should come to some definite understanding as to what is to be our policy in regard to the tramcar. Some of us have already statutory powers for considerable extensions throughout the districts surrounding our various urban communities. We are now faced with the problem of the motor omnibus on the one hand and the enormous cost of laying new lines on the other. There is no doubt that we must provide better travelling facilities than we are giving to-day. In some places, perhaps more in Scotland than in England, our people are going to be more spread-out than they have been hitherto, and these people must have the best and cheapest transit that it is possible to give them to and from the centre. What means of transit can cope with this traffic in the most efficient way?

Some, I believe a very few, say the railway. Others are enthusiastic in support of the motor omnibus, and, of course, a great many, I believe a large majority, call for the extension of the tramway. Each one of these systems of transit has its limitations, but I believe the most popular means of travel to-day is the tramway.

If it is decided that the tramcar holds the field, and that the new conditions which will arise through the spreading of the population must be met by an extension of the tramway systems throughout the country, we will be faced with a huge amount of work.

We will require to consider, in order to give rapid transit, whether we could not make more tramways along their own right-of-way. We will also require to consider whether there could not, with advantage, be more amalgamation of tramway concerns. I have for some time been of opinion that there are at present too many tramway authorities. The idea that a tramway car must turn at some imaginary boundary line is surely very absurd. The electric car should not be curbed, cabined, and confined as it has been in some places up till now. I believe we have in the electric tramway an instrument which is far ahead of any other for spreading the population.

WHERE DO WE STAND MECHANICALLY?

In asking this question I want to know whether we are thoroughly up-to-date in our plant, chiefly in our rolling stock. Have our managers selected the best type of car for each set of conditions? We know that the car which is best for one tramway undertaking might not suit another. Have our managers studied every phase of this question? Are they all satisfied that they have the best equipment for the conditions under which they have to work? Have they visited other concerns and studied the methods adopted for selecting and maintaining the equipment, or is each manager here satisfied that he has nothing to learn? I hope not. This, of course, is more a managerial question than one for committee members, but we committee men all take an interest, as far as we can, in details. We like to see our rolling stock look well. We know that when a car looks well it is almost certain that the equipment is being well maintained. During the past five years all tramway concerns have had great difficulty in obtaining material, and this difficulty still continues. In many places the track is in a dreadful condition, and some committees have been severely dealt with for placing contracts for rails abroad, although the only alternative was to allow the track to go to ruin.

Councillor Kelly,

Convener of Glasgow Corporation Tramways.

Whatever happens we must maintain our track and equipment. I know that some concerns have been unable to do this, and I am sorry for them, because there comes a point in the depreciation of plant when maintenance is impossible.

WHERE DO WE STAND ELECTRICALLY?

This question does not affect tramway undertakers generally, as the great bulk of Tramway Committees purchase the current for the tramways from another department of the Corporation. A number of Corporations, however, have a separate tramway power station. Great changes are shortly to be introduced into the electrical world, but we are yet very much in the dark as to what effect these changes will have, either on those tramway undertakings which purchase their current or on those which generate their own. Our great concern just now is the supply of coal. We know that the price is bound to go up whatever happens. What we do not know is whether we are going to get throughout this winter a sufficient quantity of coal to meet our requirements. In 1901 we purchased better coal at 6s. 9d. per ton than we are getting to-day at 29s.

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I do not think it is necessary to say anything in regard to the method of traction. We are all convinced that the overhead system has still no rival.

How Do We Stand Economically?

This is perhaps the most important question I have asked to-day, and in a paper such as this I can only touch the fringe of it During the past few years great changes have taken place both on the revenue and on the expenditure side of our tramway account.

The revenue of a tramway undertaking consists almost solely of passenger fares, and there are now only one or two tramways in the country on which the fares have not during the past three years been increased. Only a very few have been able, however, to increase the statutory maximum. These increases have almost invariably resulted in a largely increased revenue. There would no doubt have been an increase in revenue even although fares had remained as before, but the increased fare has increased revenue to a much greater extent. This means, of course, that passengers are prepared to pay any reasonable increase; indeed, I do not know of a single case where a reasonable increase has reduced the amount of travel. It looks now as if fares are going to be permanently higher.

Some years ago there was a controversy between the tramwaymen in this country and the street railwaymen of America as to whether our system of graded fares or their system of a flat fare was the proper system. The 5 cent. flat fare in America, owing to the increase in expenditure, is now found to be too low; in other words, it is not producing a sufficient revenue to meet working expenses. The Americans therefore are now up against a very serious proposition. A number of companies have, I understand, increased the flat fare to 6, 7, and in some cases to 8 cents. This means, of course, that there is no short distance travel, and the revenue is not increasing. This is a very serious state of matters, which many of the American companies have at present to face.

With us I think it may be said that, at the present moment, at all events, our revenue is all right, but what of our expenditure? The bulk of the expenditure of a tramway undertaking consists of wages, and this item has gone up since 1914 over 100 per cent., and still further demands are being sent in for further concessions, both in hours and wages. For some years back we really cannot be said to have been managing our own concerns. We have simply had to pay wages which have been fixed for us, and have had to pay prices for material which we were powerless to question.

The question of capital expenditure is now more serious than it has ever been before. Both municipalities and companies will require to expend large sums in extensions and for increased plant and equipment in the near future. Will we be able to borrow the necessary capital?

We must also look carefully into the provision we have made to meet depreciation and the cost of renewals. The provision we made prior to the war, if then just sufficient, must now be increased by at least 100 per cent.

I am against a municipality running a tramway in order to make a profit to be handed over in relief of rates, and I am also against a tramway becoming a burden on the rates. The fares charged should yield sufficient revenue to meet operating expenses, maintain the undertaking, and meet all fixed charges. I believe many of our municipal systems are too small and circumscribed. In many instances all that is wanted to ensure financial success is a linking up.

Where Do We Stand Traffically?

I may have coined a new word here, but I have no doubt that the meaning is plain to you all. During the war we had all great difficulty in maintaining a satisfactory service, and loud and long were the grumblings on the part of the travelling public. Other means of travel disappeared or were restricted, and the cars had to bear the burden. In many places we are not any better after ten months of peace.

The question of traffic is coming very much to the front at present, and if the population of our towns and cities grows steadily for the next few years, we must tackle the whole question, not only from the point of view of the tramway traffic, but of all classes of traffic. Many wonderful proposals are being made to us from time to time, but it is very striking how very impracticable these proposals generally are. Some people wish to see the cars entirely removed from the central parts of the system. Others propose to turn all cars in the centre. A section of the community considers that the only solution is a system of tubes, such as we have in London, or elevated lines, as the Americans have in several cities.

My own view is that if the city traffic generally were scientifically regulated, we could use the surface of our streets to much better advantage than we do at present. In most towns and cities the great bulk of the streets are quiet, even deserted, while the few streets are congested beyond measure.

As the population increases and spreads itself over a wider area, our difficulties will increase as the great trek is always to and from the centre. The lay-out of some of our older cities does not lend itself to the formation of alternative routes, and at the present time the whole traffic is being carried on one main artery. This is not as it should be, and steps must be taken immediately to relieve these main arteries by opening up new ones.

People not only want a cheap and frequent service, but they want a rapid service, and this can only be given by a thorough system of traffic regulation.

We have heard a great deal about queues, such as we have had recently at many a shop door, and which we still have at our music halls and picture houses. The great drawback is that where this system might be of some service, it is quite impossible to adopt it.

Some cities have a bye-law under which slow traffic must keep as near the kerb as possible. This has been found of great service to all fast traffic. Some cities also have a bye-law which prohibits any kind of traffic passing between a tramcar and the kerb at a stopping place when passengers are entering or leaving. This bye-law is also of great service when drivers know that it is strictly enforced. Of course many of these matters come more directly under the police authorities, but I am afraid that very little forward movement can be looked for from that quarter. Indeed, unless the tramway people take up the question, nothing whatever will be done.

I might speak about driving, about speed, about accident prevention, about overcrowding, and many other questions which naturally fall under "traffic," but I refrain. I have dealt with these subjects, not as an expert would have done, but simply as a member of a Tramways Committee. I have not touched on the labour question, the settlement of disputes, the inauguration of Industrial Councils. These matters will all be very much in evidence in the near future.

The municipalities of this country employ many thousands of men and women. They operate hundreds of miles of single track and have expended millions in capital. The income and expenditure were never greater than they are to-day, and the number of passengers is mounting up year by year. We must therefore take such steps as may be necessary to ascertain where we stand in all sections of our work, and this is most assuredly the proper time to make a move in this direction.

During the past five years I think it may be safely said that we never knew where we stood. This is not as it should be.

The work of the Municipal Tramways Association is really only beginning. I trust that this Association will continue to be, as it has been from its inception, an active and virile body. I trust that many capable young men are engaging in tramway work, and are preparing themselves for the higher positions in the industry, and I trust that the municipalities will see that it is to their advantage to offer inducements to our best men to enter the tramway world.

Tramwaymen should get facilities for studying what is being done on the various tramway systems, not only in this but in other countries. In no other way can they so cheaply and so effectively keep abreast of the times. There is no doubt that in the years to come tramwaymen will play an important part in solving the problem of our "ways and communications." It is an absorbing study. So far as we have gone I think it may be truly said that the municipalities of this country have operated their tramway systems with conspicuous success. One reason for this is that I never met a tramwayman yet who was not in love with his work.

I wish you all health and strength to face the new problems that are awaiting you. I am confident that the difficulties which you will no doubt meet with are only there to be overcome.

DISCUSSION.

The President.—I am sure you have all listened with close attention to the interesting paper which has just been delivered. The subjects referred to are worthy of considerable discussion, especially at the present time, and I have much pleasure in calling upon Mr. Squires to open the discussion. As I have said, the paper is brim full of interest, and I hope there will be more speakers to follow Mr. Squires.

Mr. W. J. Squires (chairman, Highways Committee, London County Council Tramways).—When the Executive asked me if I would open the discussion on Councillor Kelly's paper, I felt some little temerity, yet at the same time I thought it was somewhat of a compliment paid to the London County Council, to which I belong, and if any comment or remark which I may make is not quite suitable to Glasgow I hope the conference will forgive me, because the distinction is very great between London and Glasgow so far as tramways are concerned. I feel rather timid for one reason. I remember well indeed the conference at Glasgow when my good friend, Mr. Whittaker Thompson, illustrated something which he was saying by an allusion to Glasgow as the Mecca of all tramway undertakings. Now, Mr. President, in the face of that I have something to be careful about. It will be convenient to follow the heads of Councillor Kelly's paper in discussing the points he raises, but we must always bear in mind what we must consider in dealing with these questions in our own particular undertaking. He recognises the folly of laying down hard and fast rules, and he has refrained from doing so. "How do we stand politically?" This is a question which I am unable to answer, and I doubt whether anyone can. The problems have been the subject of exhaustive examinations by two Select Committees of Parliament and one Royal Commission, but so far no practical step has been taken to unravel the traffic problems of the Empire's capital. The traffic question of London presents features without parallel in any other

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traffic centre, and this is largely due to the magnitude of the area and the requirements of the metropolis, and, further, the operation of a tramways undertaking in the centre of political activity bring into play forces which have no counterpart elsewhere. In London we are not masters in our own homes. At Spring Gardens we are more or less a subject state compared with the great civic republics that hold sway in the large provincial centres such as Leeds, Glasgow, Liverpool, and Birmingham. We can only hope to tackle the traffic problems which confront us when we become masters of our own house. I would deprecate any special generalisation on the question of tramways versus motor omnibuses. What we have to consider is the best way of meeting the needs of the public; that is the only question to be answered. One thing I would say, we should be careful at embarking upon capital expenditure on permanent work which will confine us for all time to a particular form of traction on certain routes. "How do we stand mechanically?" There is one point I should like to mention. I refer to the need which exists for rendering our municipal tramway systems more attractive to the public. There is a cheery atmosphere about the brightly painted omnibus; and if I were to venture to give a word of advice to our municipal managers, I would say to them that they must aim at magnetising the public, and they must always try to be a little bit ahead of the other man. "How do we stand electrically?" Councillor Kelly rules out all rivals to the overhead system. I think it would be wise to mention just here that the majority of the routes of the London County Council are on the conduit system, and I feel anything I say on that point must be——

Mr. J. M. McElroy (general manager, Manchester Corporation Tramways).—Without prejudice. (Laughter.)

Mr. Squires.—That is so. The advantage of the underground system for certain classes of thoroughfares admits of argument. In London we had our hands forced by the fact, and I want the conference to note this, that twenty-eight local authorities have it in their power to veto us on overhead traction, and they do not always use that power with mercy, discretion, or judgment. I can quote the fact that with one particular Borough Council we have been negotiating for seven or eight years to electrify a certain route, but up to the present we have not been able to carry out what we want to do because of the fact that they have the veto. "How do we stand financially?" This is the paramount question. All the other questions must wait to be answered until the problem of finance and solvency has been tackled. There has been a great outcry on the part of the public against the increase of fares, and governing authorities have pandered to that outcry. Councillor Kelly says that the tramways should pay their way, and that view is the only sane and possible one to take. While some articles of food have increased up to 300 per cent., tramway fares have crept up by 25, 30, and 40 per cent., and in some instances up to 100 per cent. This is necessary to meet the increased cost of operation. It has to be recognised that the war has involved a permanent increase in every department of life. There is no logical justification that this service of passenger transport should be worked at a loss so as to carry on with pre-war fares while every other business is to be allowed to alter its charges. The aim should be to make both ends meet, but not to make a profit. I would put by a substantial margin to provide for full depreciation, and on these lines finance would be absolutely sound. I put that before you for your consideration in framing future policy. The spectre of national bankruptcy is in every man's mind, and we are entitled to the support of the Government in our fight provided we move along on a sound financial basis. "How do we stand 'traffically'?" I think that tramway undertakings should take the public more into their confidence as to the difficulties they have to meet. In this connection there seems to be a need for more publicity and more openness. What is wanted is initiative, experiment, and imagination. These qualities should be brought more to bear upon the study of traffic problems. This brings me to a final word, and if I may—perhaps it is rather a personal reference—I would like to say that I have now served nearly twenty years on the London County Council, and for twelve of these I have been attached very closely to the Highways Committee and all tramway matters, and I have come to the conclusion that at no time in the history of tramways was there such a call upon all connected with the undertaking to face the great difficulties that seem to be crowding in upon us with full determination and resolution to secure and to maintain for the future a position which shall be a credit to all concerned. (Applause.)

Mr. Jackson (member of Liverpool Corporation Tramways Committee).—With very great interest I have listened to the address of Councillor Kelly. He says, "Where do we stand?" This appeals to me, for I think that our stand at present in the tramway world is not what I as an Englishman would like to see. To me we appear to be standing still. We are not in the forefront. In the many countries that I have had the honour to visit I sometimes think that they are making greater progress than we are doing in the old country. In my opinion it is such a meeting as this, and such an address as we have just listened to, that will perhaps awaken some of our municipalities and make them more interested in tramway work, for we have a lot of work to do, and to do it we must consider very seriously all the points that Councillor Kelly has made. I do not want to labour or delay this meeting, but what I want to emphasise is that we have very much to learn from other countries. In one of them they talk of a four hundred and eighty mile electrically run train through the Rocky Mountains, which to us would be something not possible to think of with the present view we have of electrical traction in this country. Therefore when we speak of progressive movements electrically it behoves us to investigate what is being done abroad; and I appeal to every municipality to give an opportunity to its managers, deputy managers, and electrical engineers to visit the whole world if necessary—(hear, hear, and laughter)—because I can assure you that they will gain vision, outlook, and a practical knowledge which will be invaluable to them in considering the problems of transport here in this country. I have visited electrical installations in all parts of the world, and I would say again to municipalities, let the men go, let even committees go. (Loud laughter.) The man who to-day is civically interested in the question of transportation is the committee-man, and if he is willing to sacrifice his home life, and if his wife will let him go—(laughter)—and if he will sacrifice his business interests for a certain time, it will well repay any Corporation to send him abroad. If the Corporation has spent £500 on his journey, he will repay it by £10,000 by what he will learn and give to that community. There is one other point I should like to make, and that is this. You must collect your fares. That is my answer to the question, "Where do we stand economically?" The trouble with most of the big undertakings is that they lose thousands of pounds per year owing to their inability to collect all fares. Take the great steamship companies, in which I am personally interested. You cannot get on board any steamer without paying your fare. With the railway companies it is the same thing; by their system of inspectors and barriers all their fares are collected. I claim that on many of our busy tramway undertakings the fares are not collected as cleverly as they ought to be. That is because we have not yet learned the latest American system. I do not want to quote America as being head and shoulders over us, but I take off my hat to America in the matter of transportation. On the "pay-as-you-enter" car nobody travels for nothing. We want to get the money, and with that money we can pay better salaries. I would like to see general managers paid not £700, £800, or £1,200 a year, but from £2,000 to £3,000. (Hear, hear, and laughter.) If a manager is not worth anything up to two or three thousand per year do not have him. (Laughter.) Brains must be paid for. Do not worry so much about cheap men. Get the best and brightest men, even if you have to import them from somewhere. (Applause.)

Alderman F. Smith (vice-chairman, Liverpool Corporation Tramways Committee).—"Where do we stand as a matter of policy?" We can make more tramways along tramway-owned rights of way. In Liverpool we have made experiments in this direction, and can run at greater speed to outlying districts, consequently giving the people more rapid transit. "Where do we stand mechanically?" We know well that to stand in the best place mechanically you must have good men and you must pay them well. Are you going to let your best men inspect other places or are you to force them to strain their own intellectual capacity in trying to evolve what may be seen by careful observation? A Japanese from the Ministry of Communications in Tokio called upon me many years ago, and I sent him round our system with a friend who gave him the best information available with regard to Liverpool. When he had been back in Tokio some months he wrote to me a letter to say that at Liverpool he had seen some things that were of great advantage to him. Japan thus obtained advantage from sending a man for an extended tour to see what he could find out. I agree with my colleague that it is useful to send both engineers and members of committees to make observations in various parts of the world. Councillor Kelly asks "Where do we stand electrically?" Nobody knows where electricity is as a science. The immense development that has taken place since Liverpool acquired the electrical undertaking is such that no one may foretell the speed or volume of electrical development. We should take care to forward that science in every possible and reasonable way. With regard to overhead traction, we had a big fight in Liverpool. Six members were sent abroad, and we decided that the overhead equipment was the proper installation. I am glad to know that the result is now fully approved by the tramway world. "How do we stand economically?" Is there economy anywhere? (Laughter.) If so, where is it? I say there is no economy; there is a wasteful and extraordinary disregard of economy everywhere that is astounding. (Hear, hear.) I am right up against our friend when he says that he wishes the tramway to make a profit. He means to say that the tramways ought not to contribute to the rates. There I disagree with him. A large amount of money has been put into the roads by the ratepayers, and I maintain that the tramways should pay to the ratepayers what a private company would pay for such a right. (Hear, hear.) If I were a tramway manager I should want to be paid according to my ability. There are a lot of people who live in your city and who pay your rates. In Liverpool—we are very silly in Liverpool at times—(laughter)—we carry a man, even if he weighs twenty stone, and we carry a child

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weighing three or four stone, and a parcel of thirty to forty pounds, three miles and a piece for a penny. Is there any man who in his own business would do a silly thing like that? Our friend says in many instances all that is wanted to ensure financial success is a linking up. Is it? The tramway employee of to-day will say that there is a good deal more wanted than linking up. You have got to link him up or he will take every halfpenny. You talk about collective bargaining. Have those bargains been kept when made? I am one of those who believe reasonably in the working man. He is a very valuable asset; but we want somebody to tell us how to treat that asset properly so as to get the most out of it for the general good of all.

The President.—We shall resume this discussion at 2.30.

AFTERNOON SESSION—WEDNESDAY.

Councillor W. C. Turner (chairman, Belfast City Tramways Committee).—In my opinion this is a very opportune time to call to the members of this Association to take stock, and ask themselves "Where do we stand?" You have had the question dealt with at length by the speakers who have preceded me, and in my opinion I take the paper to be in a word a note of warning to the different undertakings to pull up, take stock, and look to the future. Your President said in the course of his address, "I venture to suggest therefore, whilst we should not be unduly pessimistic, we should not by any means take too rosy a view of the immediate future." The other paper by Councillor Kelly following immediately just makes out a case for the "pull up, take stock, and see what you are going to do" idea. The last paragraph in Councillor Kelly's paper is as follows, "I wish you all health and strength to face the new problems that are awaiting you. I am confident that the difficulties which you will no doubt meet with are only there to be overcome." I think that is the feeling of the members of this Association, as I am convinced that they will pull themselves together and that they will meet the future smilingly. I believe there is a great future for tramway undertakings.

Alderman W. C. Fenton (vice-chairman, Sheffield Corporation Tramways Committee).—Councillor Kelly's paper gives much food for thought, but before proceeding to deal with it I wish to say that there is one sentence in it to which I take exception, that is the phrase "In many places the track is in a dreadful condition, and some committees have been severely dealt with for placing contracts for rails abroad, although the only alternative was to allow the track to go to ruin." I do take exception to that. I am not sure that the Glasgow Corporation did a good thing in going to America for rails considering how much we already owe to America. I hope all tramway undertakings will do their best, even if they have to pay more for their rails, to get rails manufactured by English manufacturers, and thus help at the present time with the very difficult labour problems which now confront us, and when there may be a considerable number of men out of work. I quite agree with him when he speaks of the advantage of more amalgamations of tramways concerns. Of course we are up against the question of gauges in very many districts. I think it opens up the wider question, and one which is rapidly coming to the front, whether large Corporations particularly, apart from small Corporations, should not have greater power of local legislation with regard to their immediate concerns than is granted to them at the present moment. I quite agree that we are paying far too much money in going to Parliament for small extensions, and for amalgamations and other things which affect districts locally, instead of being able to settle these things ourselves, as we could do and in a much cheaper and quicker form. We have come to a point when Parliament will have to be asked to reform local administration so that it will not be necessary to go to Parliament to get sanctions of this sort. It is obvious that there would be a great economy in the costs of transport if different local authorities could link up without the cost of going to Parliament, and could come to some arrangement of their own by which they could more economically work from one centre. That is one direction in which we may look for cheaper transport for all classes, not only for passengers but for goods as well. We should then be able to deal with questions of transport in a far more efficient manner. I think it is up to the Municipal Tramways Association to push forward this agitation for greater freedom in local administration. If this is carried out I am quite certain that we may look forward confidently to a prosperous future with more convenience to the public and a reduction in the cost of working.

Councillor Irving, M.P. (vice-chairman, Burnley Corporation Tramways Committee).—I will not detain the gathering very long, as I do not think a conference of this description lends itself to a discussion of details. They are best worked out in committee, whether local or national, but I do, however, think that it is a place where principles and the policy proceeding from principle can be very well discussed. One of the speakers has criticised the paper, taking objection to the point of view that the tramway system should not devote so much of its attention to making profit. By implication he seemed to infer that the people who do not use the tramways were going to be penalised, in the sense that those who do use them would get all the advantages, whereas those people who did not use the tramways so much would be put to a disadvantage, inasmuch as they would not receive the benefits the tramway system conferred. It is that aspect of the question I wish to discuss. I think a tramway system should be worked on the ideal that profit should not be considered at all, that is, not profits in the monetary sense, but profit in the real sense of comfort, convenience, and pleasure to the citizens of the community; these are far away in advance of any monetary benefit that you can confer upon the community—a profit of that kind is invaluable, and one to which tramway systems should bend their best energies. If you look at it from the other point of view, that of disadvantage to those who do not use the tramway system, I think it is just on the other leg that the onus of proof ought to stand. Why should an individual who does not use the tramways use the profit extracted from the car user by higher fares than are necessary for the relief of himself from rates levied, say, for the provision of healthful and sanitary functions for the benefit of the town generally? It is in that sense that the non-user of the tramway car is exploiting the user to the disadvantage of the public for whom the tramways exist. It seems to me that if that idea were followed more closely we should have a very much more perfect system of local tramway administration where profit would not be measured in money terms but in terms of useful service to the community. I do not want to give to the tramway-using public more than they are paying for. I concede that the tramway system should work on business principles, but not as if it were solely in the hands of private persons who had their livelihood to make out of their venture. There is an absence of that necessity in the case of a Corporation. They need not from that point of view set out to make any profits. There is the other question referred to, that we should make a profit in order to pay the community for the use of roads. I think most of us who have had anything to do with tramway systems know that whilst you may not contribute directly to the reduction of rates, yet by charges for electricity, for the use of electric energy, charges that road administrations call upon you to pay for the maintenance of roads, and other methods which apply indirectly, the tramway activities after all do redound to the advantage of the community, and in a very effective way do contribute in an indirect fashion to the benefit of the community. I would urge upon members of the Association to realise that whilst to safeguard against loss I think we need a considerable margin, that margin is only required in case of actual loss, and when that is non-existent should be used in order to help to make the tramway system a concern which is free from all responsibility other than giving the best possible service and convenience to its users.

Councillor Charles Coggan (member Nottingham Corporation Tramways Committee).—I am sorry to disagree with the last speaker as I do on the score that he does not treat the tramway system as a commercial proposition. I think we have a right to make a profit and that we are perfectly justified in doing so. I wish to convey to the Executive Committee that our committee at Nottingham, although it is composed to some extent of Labour members, have reached the parting of the ways in regard to payment, and if anything I can say would strengthen the backs of our Executive Committee in regard to this question I should only be too pleased I had come to Dundee. Let it be remembered that many of the younger generation are earning high wages, but do not contribute a penny to the national or municipal revenue, although spending extravagantly on picture palaces, music halls, etc., and we do think that the time has come when a stand should be made as an alternative to giving way every time to every unreasonable demand—this in the interest of the general community. If a strike were forced upon us, it would only be a little inconvenience, and we should get a large section of the public favourable to our views. I do hope the Executive Committee will realise that committees of undertakings in the country are of opinion that the time has come when a common stand should be made. (Hear, hear.)

Mr. W. Murray (manager, Walthamstow Urban District Tramways).—I think the one great difficulty in dealing in a profitable manner with a discussion such as this lies in the vast differences which exist in the various tramway undertakings represented here and which are planted all over the country. There are differences in size, in local conditions, and in surroundings which make it well nigh impossible to deal in a general manner with the needs of all. We can all understand that what may be facts in relation to Glasgow may very well become fallacies in relation to Walthamstow. I have butted in at this moment for the reason that I do not want to leave all the talk of this conference in the hands of gentlemen representing large undertakings. I would like—I do not know whether I shall succeed or not—to try to drag the discussion back to things practical. After the romance and excitement generated at the morning session it is difficult to get down to details of any kind. I want to suggest that there has been an acknowledged custom in the past, when any municipality wanted to know about tramway work, to send to the large undertakings—Glasgow, Leeds, and other places—to learn

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how to do it, and when they wanted a manager they generally did the same thing, and the probabilities are that in both cases they did the utterly wrong thing. (Hear, hear.) Glasgow, we all know, has made itself world famous by the success of the halfpenny fare, and many other tramway undertakings have tried to follow its lead, and some have lived to regret it. What must be remembered is that conditions are not the same there as they are in other parts of the country, and, because of that, it is impossible to outline any policy which will be applicable to all. We all know that where you have an immense population, wide streets, double track, and a town surrounded by a dozen other towns of considerable size all feeding the traffic, that there the tramcar is unrivalled. This is the position in Glasgow. But what is true of Glasgow may not be true of other undertakings; and what is a clear and unchallenged policy in Glasgow may not be a policy which should commend itself to you and me. For example, some of us have comparatively light traffic, single track and narrow streets. Our undertakings have been outgrown by the increase of population, and we are now up against the difficulty of deciding what our policy is to be in the days to come. We are faced with enormous expenditure for street widenings and track, etc., construction, and some of us under present conditions cannot face this expense. The question is what is our policy going to be with regard to the future? We stand by trams so far as we can, but we all know that the motor omnibus has some very real advantages—(hear, hear)—and one of them is that even if it travels at the same maximum speed as the tramcar it gets from point to point more speedily. With regard to Glasgow they have a street regulation which compels slow moving traffic to keep to the side of the road, but in other towns the slow moving traffic invariably delays the progress of cars. This is a disadvantage to the public, and it is also one which so handicaps us that we are quite unable to compete successfully with the omnibus. It is well nigh impossible. There are some things with regard to policy which we might have decided in the past, but in many cases we have lost our opportunity. I say we ought to have endeavoured to resist to the very utmost a national agreement as to conditions of service and wages. This was the one mistake we made in the past. There is no gentleman present here who can suggest that the conditions of labour, say, in Oxford, are comparable with the conditions of of labour in London, Glasgow, or Manchester, and why therefore should a national agreement have ever been entered into in regard to conditions of service? The same thing applies to wages. I hope we are at last going to take up a firm stand. These things ought to be settled in districts, and we should refuse a settlement on any other lines. "How do we stand mechanically?" I think that in the past we have been too conservative in these matters. I have always had the impression, and it has been shared by other managers, much more experienced than I am, that single truck cars alone were suitable for working over single track, and I gave way and deferred to this opinion. We were recently compelled, however, to buy a few long bogie cars from a neighbouring undertaking, and I am surprised to find that they are running better over the single track than our own cars. I do not think that I would again advise the purchase of single truck cars. "Where do we stand economically?" Sir, I think the answer to that unfortunately is that we do not stand at all. Some of us are tottering and some of us have already fallen, and I fear that in the near future some may be grovelling in the gutter of insolvency. I am delighted to have heard the paper, and Councillor Kelly is to be congratulated in having introduced a real practical live subject.

Councillor H. W. Wale (chairman, Coventry Corporation Tramways Committee).—There is a good deal of matter in Councillor Kelly's paper which is well worthy of consideration by all small undertakings. We are in the unfortunate position at Coventry that the population has outgrown the undertaking, and we are faced with huge street improvements. I think in Coventry we have got some of the narrowest streets in the world. We have got a traffic problem there which is not equalled anywhere in the kingdom, and I think the solution of the problem to a large extent lies in amalgamation with large municipal undertakings. I believe if we take a too conservative view of the present situation that generations to follow us will curse our very name in the same way as we are cursing those who preceded us for their lack of imagination. I agree entirely with everything Councillor Kelly has said in regard to amalgamation. It seems to me that this is the day of the big unit, and I hope that there will be an opportunity afforded to some of you when Parliament, instead of wasting time upon things which are totally unpracticable, allows the municipalities to conduct their own affairs with regard to this and other analogous questions.

Councillor J. W. West (member Walthamstow Urban District Council).—The first question is, "Where do we stand politically?" Mr. Murray, our manager, points out that you cannot lay down a hard and fast policy for every place in the country. To that I agree, but I think there is a policy that at any rate can be agreed upon which is to attempt to give the best means of transport that is possible to the whole country, and leave each individual section to work out its best methods. This is a policy that could be definitely agreed upon. It has been pointed out by Alderman Jackson, of Liverpool, that opportunity should be given for sending men abroad in order to ascertain what other countries are doing. It seems to me that in that direction this Association could help very largely in finding out what are the best means both mechanically and electrically, and in every other way that concerns a tramway undertaking. I think this Association, in common with other associations—I belong to an association myself of property owners which does everything it can in the interests of property owners generally—could do much to help to bear the expense of sending men abroad, and that a scheme could be formulated by which men could be sent if it was felt necessary. They might select the men, and ask for contributions from the various authorities towards the expenses.

Councillor J. Fryer (Birmingham Corporation Tramways).—I just want to support the writer of the paper in the attitude he takes up about linking forces. There are two points that have not yet come out. In the first place, the gentleman from Nottingham shows clearly what is the true inwardness of this movement. If you are going to provide large sums of money for the relief of rates, how are you going to meet the statement of your operatives that the undertaking can pay higher wages? The financial stability of your undertaking must always be your first concern.

Councillor Kelly (chairman, Glasgow Corporation Tramways Committee).—My main object in preparing this paper was really to provide food for discussion, and I think in that respect we could vote that the paper has been a success. I do not propose to answer any of the detailed criticisms of my paper which have all been of the most friendly nature, but in regard to the question of the tramway rails, let me say at once that I had in my mind the experience of the city of Glasgow. We were without a single length of rail. We had a contract running with an English firm, but deliveries were stopped, the firm explaining that their men were on strike. We asked for offers, but English firms could not give delivery until the month of October, and as we urgently required rails we had no option but to accept the American rails. I should like to say, however, that the policy of Glasgow has always been and will be to support home industries even although it costs us more. With regard to the question of applying tramway profits for the reduction of rates, I think any undertaking can do well if they take care to provide every year a good sum out of profits for maintenance, repairs, and renewals. That is what we did in the city of Glasgow, where we amassed a sum which, added to the sinking fund, paid off the debt on the undertaking. We have always had low fares in Glasgow, and of course the public have not complained. I would say that in Glasgow at least a very small proportion of the members of the Glasgow Corporation would vote for tramway profits being applied to the reduction of rates. We have now in Glasgow a surplus of four million pounds, and I think the city is entitled to some return on that four million pounds, which can hardly be claimed to belong to the present car users. It is a city asset. Regarding fares, it is the halfpenny fare that is the trouble with us. They love halfpenny fares in Glasgow, and they will not let them go, and the consequence is we are nearly at bedrock, and my expectation is that our general manager will show that for the first three months of the present year we are not paying working expenses. So we are not without our troubles in Glasgow. I admit, and every man must admit, that every municipality and every district must consider their own circumstances, and must decide on their own policy. I have not laid down hard and fast rules. You must find your lead by yourself. If this paper has made you think over some of these points then it has served its purpose. I consider it a great pleasure to have been allowed to read my paper. It has been a great pleasure to me to be here. (Applause.)

The President.—I am quite sure it is your wish that we tender our very best thanks to Councillor Kelly for his excellent paper and for the very interesting discussion it has brought about.

The motion of the President was enthusiastically carried.

The President.—That, gentlemen, concludes our business for to-day.

MORNING SESSION—THURSDAY.

A meeting of the Managers' Section was held at 10 a.m., the president in the chair, when the question of resuming the managers' meetings next year was considered. Mr. A. Baker, general manager Birmingham Corporation Tramways, said that the managers' meetings, which had been very profitable in the past, had been discontinued on account of the war, and he thought it was extremely desirable that they should be resumed. He repeated a former invitation to hold the next meeting of the Managers' Section at Birmingham. The president expressed the opinion that they ought to resume the meetings, and subsequently Mr. Baker's invitation to visit Birmingham was unanimously accepted, the date to be settled later.

The full conference met at 11 a.m., when the president called upon Mr. Fearnley to read his paper on "Motor Omnibus Services"

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MOTOR OMNIBUS SERVICES.

By A. R. FEARNLEY
(*General Manager, Sheffield Corporation Tramways and Motors*).

On many occasions recently when the question of road passenger transport has been under discussion the opportunity has been taken of suggesting that extensions of electric tramways should not be made, but that any further transport facilities required on the roads should be provided by motor omnibuses. This opinion, of course, comes from those who have had no experience of handling passenger transport work by the electric tramcar.

In my remarks on this subject I propose to look at the question from the point of view of the municipality engaged in passenger transport work, and to show as a result of the experience gained whilst working motor omnibus services as auxiliary to a large tramway system during the past seven years how, and to what extent, motor omnibuses can be best made use of.

Under present conditions it is comparatively easy for any municipality to obtain powers from Parliament to work motor omnibuses within their own district, and despite the opposition which is generally met with from railway and motor omnibus companies, County Councils, and Urban District Councils, they can also obtain powers to work omnibuses in the districts adjoining their boundaries, on terms which vary from time to time according to the views of the Parliamentary Committees and the strength of the opposition met with.

In 1907 the Sheffield Corporation obtained a clause which reads as follows :—

> " The Corporation may provide and run motor omnibuses within the city and also in connection with their tramways in certain districts adjoining the city on the following routes."

Then follows a description of the routes outside the city boundary on which the Corporation are authorised to run motor omnibuses, and as will be seen from the subjoined map most of the main roads leading into the city are now provided with omnibus services, and on those which are not so provided powers have been already obtained, and in a short time services will be in operation.

Another clause provides that the Corporation shall make payment to the road authority of ¾d. per omnibus mile run by their motor omnibuses ; also, that the Corporation shall not be required to make any payment in excess of the sum of ¾d. per omnibus mile in respect of any road which has not been constructed or re-constructed so as to be adapted for mechanical traffic.

Further clauses provide that the Corporation shall not be required to make any payment in respect of the cost of raising the standard of any road to meet the requirements of mechanical traffic, and that if a grant from the Imperial Exchequer is made in respect of any road towards the cost of maintenance the amount to be paid by the Corporation shall be proportionately reduced. These clauses remain operative for at least five years from March 31, 1919, and were settled by agreement with the West Riding County Council and the Derbyshire County Council so recently as the summer of 1918, after they had had five years' experience of the running of the motor omnibus services over their roads.

Another clause in which the Sheffield Corporation appear to have been more fortunate than many other undertakings is in the fare clause. Our clause in regard to this matter reads as follows :—

> " Clause 164 :—
> " Par. (3).—The Corporation may demand and take such reasonable fares and charges for the conveyance of passengers and parcels in or on their motor omnibuses as they may think fit."

With the Parliamentary authority above referred to, the Sheffield Corporation commenced, in 1913, to run motor omnibus services on a number of routes within the city, and as extensions of their tramway routes outside the city, and have continued since that date as opportunity offered to extend such system, until they have now services covering 37 miles of road, of which 15 miles is within the city boundary, and 22 miles outside the city, on County Council roads, and employing altogether about 40 motor omnibuses. This has not yet fully met the various demands which had been made upon the city to provide such services, and at least half-a-dozen additional routes are contemplated, a number of which are to be put into operation as soon as a further supply of suitable omnibuses can be obtained.

When the city took up this work some so-called services were being provided by private enterprise on three or four of the outside routes. The services were irregular and quite unreliable, and the tramways department was literally bombarded with requests that they should take up this work and provide regular and efficient services. On two routes, in order that the people who were working the services should not be subjected to any serious hardship, the city voluntarily purchased the vehicles and replaced them with their own omnibuses.

The results of the first three years were excellent, but, of course, war conditions, especially the last two years, made the working of the services very difficult, and at times, owing to the inability to obtain spare parts and carry out repairs, almost impossible. Expenses have increased enormously, that is, from 7d. per omnibus mile at March, 1915, up to 14d. in 1918, and 17·8d. in 1919.

The expenses for the last two years are as follows :—

SHEFFIELD EXPENDITURE.

	1915. Average per 'bus mile. Pence.	1918. Average per 'bus mile. Pence.	1919. Average per 'bus mile. Pence.
Traffic expenses	3·012	4·931	7·086
General expenses	·370	·380	·532
Repairs account...	1·915	4·411	4·528
Road maintenance account ...	·055	·146	·200
Power expenses (petrol) ...	1·683	4·154	5·550
Total working expenses	7·035	14·022	17·896

The vehicles consist at the present time of 26 Daimlers, 12 A.E.C., one Tilling-Stevens, and one Pagefield (the two latter having been purchased for trial purposes)—75 per cent. being double-deck and 25 per cent. single-deck omnibuses. Although there is little doubt that on country roads the single-deck omnibus is the more satisfactory type of vehicle, the preference in the district for the double-deck omnibus is so pronounced that we have tried as far as possible to meet this requirement, at the same time obtaining the advantage of the greater seating capacity of the double-deck over the single-deck vehicle.

The roads and districts which we work and provide with motor omnibuses are :—

(1) City roads, which are largely parallel with existing tramway routes, and which in the centre of the city run over and connect up with busy tramway tracks and routes through districts which are not fully served by the tramways, and into which districts, for various reasons, it is not possible, or advisable, to take tramways.

(2) Roads which branch off from tramway routes into districts where there is considerable traffic, especially in the summer time, by people who are making their way into the country where the scenery is attractive and which, consequently, are used largely by the citizens and visitors for pleasure trips.

(3) Extensions to existing tramway routes which mainly have their terminal points at the city boundary into adjacent villages and rural districts, reaching as far as seven miles from the tramway terminus.

On all three classes of roads the motor omnibuses have proved successful and are meeting in a reasonable way the requirements of the districts served.

Dealing with the class of road (1) (city routes) just referred to, this class of service undoubtedly provides a great public convenience for short distance cross-town traffic through streets and districts which cannot be served by cars. The serious opposition and friction that arose when some of the services had to be suspended during the war proved how much they were appreciated, and led to a restoration of the services at the earliest possible date.

With regard to routes such as (2) (roads branching off from tramway routes), the traffic which has been developed on this class of route is enormous and has astonished its most sanguine advocates.

Roads which were previously served by horse-drawn chars-a-banc, and in some cases having no services at all, in a very short time called for regular 20 minutes service on week-days and six or seven minutes services at the week-ends.

The third class of route referred to as extensions to existing tramway routes has also proved very satisfactory, and should have the serious attention of all municipalities who have made themselves the transport authority for their district. In addition to paying their way as omnibus routes, they have brought a great amount of traffic to the tramways which formerly did not reach them, and some idea of what this means in the summer months may be gathered from the motor omnibus traffic return for the

LAST COMPLETED WEEK ENDED AUGUST 17, 1919.

Receipts	£2,172 7s. 11d. (fare 1½d. per mile).
Passengers carried ...	159,371.
Miles run	20,768 (lost mileage, 59 miles).
Receipts per omnibus mile	25·1d.

Receipts per omnibus mile up to date this year are 23·59d.

The traffic on omnibus routes is, of course, greater in the summer months than in the winter months, the ratio of difference being much greater than on the tramways.

Thousands of people during this period of the year undoubtedly journey out into the villages which are served by the omnibuses for pleasure rides and become acquainted with the country districts, who would not otherwise do so, and passenger transport work is thereby generally encouraged. The residents in the villages make many more journeys into our city than they formerly did. The young people take advantage of the services for attending educational

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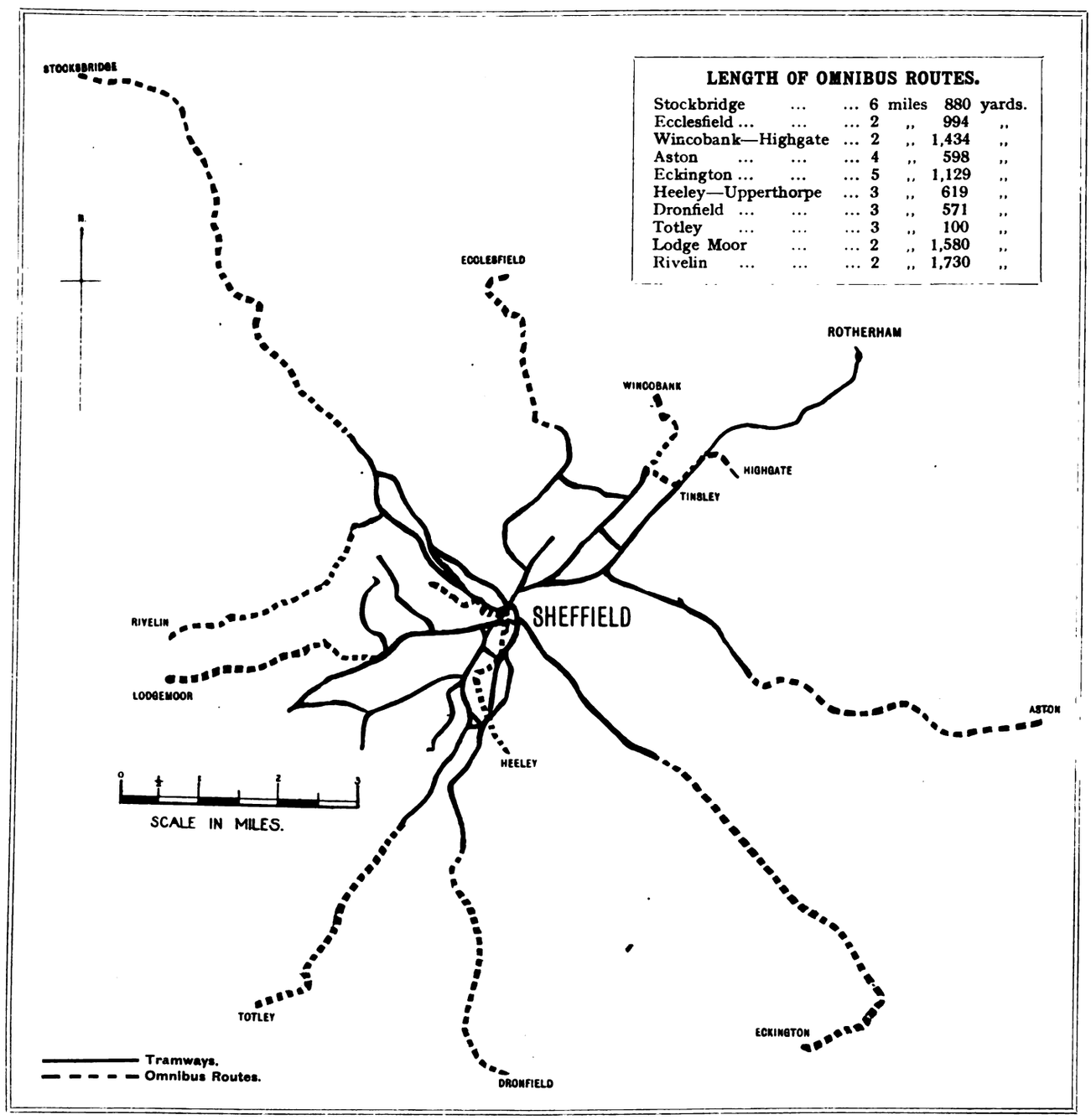
institutions, and there is no doubt that the general effect on the outlying districts is in every way of great benefit.

So much has this become apparent that when new routes are now proposed we frequently find the local authorities in opposition to their own County Councils in regard to the matter, the district authorities invariably supporting the applications for the motor omnibus schemes and using their influence with the County Council authorities to make reasonable terms.

Applications for special omnibuses for evening parties, week-end outings, schools, and other bodies desirous of travelling into districts which are not served by tramcars, are very numerous, and if encouraged this business becomes a regular and profitable one, the mobility of the motor omnibus lending itself readily to all this class of traffic.

Estimated population of villages served by Sheffield Corporation motor omnibuses outside the city. (1911 census) :—

Totley...	964
Oughtibridge	2,600
Dronfield	3,943
Aston	4,204
Mosborough	4,500
Stocksbridge and Deepcar	7,090
Eckington	12,164
Ecclesfield and district	22,404
	57,869



Map Showing Sheffield Corporation Tramways and Omnibus Routes.

The accompanying map clearly shows how and where the omnibuses are being used, that their services are well spread over the city and surrounding districts, no special selection being made, and that in a number of cases the districts are only sparsely populated.

The populations of the districts served vary from 1,000 up to 22,000, the latter having so far developed that it is shortly hoped, when expenses are more normal, to take the tramway into that district.

Having now set out generally the way in which the motor omnibuses are operated, I propose to give shortly some results and figures which, whilst I trust they will be of interest to this Conference, will also prove to the critics of tramways that their suggestion of superseding tramways by motor omnibuses requires further and deeper examination than they have yet given to it, and that it is not likely to be adopted.

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The motor omnibus, so far as it has been developed up to date, is:—

(1) An excellent vehicle in acting as feeder of and in connecting up tramway routes and services.

(2) An unsuitable vehicle for satisfactorily dealing with heavy town traffic.

(3) Quite inadequate for dealing with our peak loads.

(4) Financially impossible for workmen's traffic at reduced fares.

(5) In regard to average speed maintained throughout the day has no advantage over the electric tramcar.

The first point has been clearly shown by the description of the omnibus services in Sheffield.

To deal now with its carrying capacity. The maximum seating capacity that we have so far been able to provide is 37 against the maximum of 76 that we have been able to provide on the latest type of tramcar. As the cars seating 76 are, however, comparatively of recent construction, it would perhaps be fairer if we compared them with the new type of omnibus, one of which has just been put on the streets by the London General Omnibus Company, and which seats 46 passengers.

The great difficulty, however, from the passengers' point of view, is that only 22 passengers on the new type of omnibus are provided with cover or a comfortable seat under inclement weather conditions, which prevail during eight months in the year, whereas the whole of the 76 passengers on the tramcar referred to are under cover and travelling under reasonably comfortable conditions, whatever the weather conditions may be.

As the majority of the members know, there are very few tramcars running to-day in the busy manufacturing centres or thickly-populated districts without top covers, experience having shown that for the greater portion of the year the top-deck seat on the open-top car is of little use, and the vehicle without top cover becomes practically a single-deck tramcar.

For dealing with the peak loads the Sheffield type of omnibus, with its maximum of 37 seats, would be, of course, of very little use, and as an example of what it would mean I have taken out the figures for the five to six o'clock traffic from our Tinsley district in Sheffield, where each evening we have to provide a service during this time of 82 cars per hour, and in which time we carry 5,576 passengers at an average fare of less than ½d. per mile. It is obvious of course, that to carry these passengers the number of omnibuses would have to be double the number of cars provided, and that in wet or winter weather this would be totally inadequate for the purpose. Given this necessary increase in the number of vehicles, it is not difficult to see the serious loss which would result if the same fares as are now charged on the tramways are maintained.

It is perhaps, however, scarcely fair to ask that the development of the motor omnibus, which has taken place during the last eight or nine years, should be compared with the development of the electric tramcar over a period of 20 years.

One remembers that just prior to the war, Mr Spangler, the manager of the Vienna tramways, was experimenting with a new design of top-covered motor omnibus, he having already ascertained that the small carrying capacity in the saloon of the omnibus rendered it unsuitable for all-the-year-round conditions. It would be interesting to know whether the London General Omnibus Company have yet considered this side of the question, and, if so, what are the results they have arrived at.

There is no doubt the latest London omnibus, which carries 46 passengers, is a great step forward, and will assist considerably in the difficulties with which they are faced, which difficulties are undoubtedly largely brought about by attempting to deal with an A1 traffic load with what, so far as comfortable seating capacity is concerned, is only a C3 vehicle.

In considering this question from the point of view of the provinces, it must be borne in mind that the 3 tons 10 cwts. maximum weight allowed for the London omnibus is of no use for the provinces. Actual experience has shown us that a body of the London type after two years on the roads such as are met with in the Midlands and North Country are in such a condition that very heavy repairs are required, and, in fact, it then becomes a question as to whether such type of body is worth repairing for work under such conditions. The makers themselves have confirmed this opinion, and to-day decline to build a body of that type for use in the provinces.

Our experience has shown that 4 tons 10 cwts. is the minimum weight of a double-deck omnibus for roads such as are found in our district, and the difference in weight of vehicle per passenger carried in the provinces is therefore very little in favour of the motor omnibus, as compared with the tramcar. In one case, with a new type of chassis and body, we are having to reduce the weight a little in order to bring the vehicle within the five tons limit, and the experiences of the large Midland omnibus companies, who are working omnibuses in Warwickshire, Staffordshire, and Leicestershire, would be interesting on this point.

With regard to expenses, I have given on the attached sheets some figures for the year ended March 25, 1919, showing:—

COMPARISONS BETWEEN TRAMCAR AND MOTOR OMNIBUS.

(1) Average expenses per mile run.

(2) Average expenses per passenger carried.

(3) Average expenses per seat provided.

The figures show that:—

(1) The revenue expenses of running the motor omnibus is 44·5 per cent. more than the tramcar.

After giving the motor omnibus the benefit of its comparatively lower capital expenditure, it still costs 33·7 per cent. more than the tramcar to work per mile.

(2) The revenue expenses per passenger carried on the motor omnibus are 198 per cent. more than on the tramcar.

The total expenses per passenger carried are 176 per cent. more on the omnibus than on the tramcar.

(3) Again, per seat provided the omnibus revenue expenses are 131·3 per cent. higher than the tramcar revenue expenses.

The total expenses per seat provided are 114·1 per cent. higher on the omnibus than on the tramcar.

The average speed of the omnibuses is 9·97 miles per hour.

The average speed of the tramcars is 8·65 miles per hour.

That is: 15·26 per cent. in favour of the omnibus.

Bearing in mind, however, that 75 per cent. of such omnibus mileage as is here referred to is run on urban and rural roads, it will be seen that under similar conditions the speed of the tramcar in the provinces is easily equal to the speed of the omnibus, so that in this respect there is nothing to choose between the two vehicles.

What is very necessary at the present time to assist the motor omnibus undertakings in carrying out their work is a plentiful supply of fuel at a reasonable price, that is, not a price ½d. or 1d. below the monopoly price of the petrol ring, which is not the way

Mr. A. R. Fearnley,

General Manager, Sheffield Corporation Tramways and Motors.

to encourage the use of either benzol or any other home-produced motor fuel.

A writer in the TRAMWAY AND RAILWAY WORLD recently stated that sufficient work is available for both cars and omnibuses, and that it is futile for partisans to speculate upon the disappearance of one or the other. I think this writer correctly sums up the position.

The motor omnibus is not going to supersede the electric tramcar. It can, however, serve a most useful purpose:—

(1) For connecting up tramway routes for cross-town traffic which cannot be served by tramcars.

(2) For relieving congested tramway routes by diverting part of the traffic along other routes.

(3) For connecting up the villages and rural districts with the tramways and railways, and thereby providing such districts with regular and direct transport facilities which they have hitherto badly lacked.

In conclusion, I would like to suggest, and strongly press upon the notice of the municipal representatives present, that it is the duty of every tramway-owning municipality to undertake this work, and that the example which has been set by Birmingham, Walsall, Liverpool, Manchester, and Sheffield, who are all now operating

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motor omnibuses in connection with their tramway systems, is worthy of emulation, and, further, that those municipalities who have not already obtained the necessary powers to work motor omnibuses would be well advised to look closely into the matter at an early date.

COMPARATIVE FIGURES.

EXTRACTED FROM THE 1918-19 SHEFFIELD ACCOUNTS.

1.—AVERAGE EXPENSES.

	Tramways per car mile.	Motor Omnibuses per omnibus mile.	Omnibus Expenses are
	d.	d.	
Working expenses	12·388	17·896	44·5% more than tramways
Service of debt (capital) ...	1·688	·923	45·3% less than tramways
Total revenue and Capital expenses	14·076	18·819	33·7% more than tramways

2.—AVERAGE EXPENSES.

	Tramways per passenger carried.	Motor Omnibuses per passenger carried.	Omnibus expenses are—
	d.	d.	
Working expenses	·716	2·137	198% more than tramways
Service of debt (capital) ...	·098	·110	12·3% more than tramways
Total revenue and Capital expenses	·814	2·247	176% more than tramways

3.—AVERAGE EXPENSES.

	Tramways per seat provided per car mile run.	Motor Omnibuses per seat provided per omnibus mile run.	Omnibus expenses are—
	d.	d.	
Working expenses	·230	·532	131·3% more than tramways
Service of debt (capital) ...	·031	·027	12·9% less than tramways*
Total revenue and Capital expenses	·261	·559	114·1% more than tramways

* This is an important figure and one which is ofttimes entirely overlooked by the motor omnibus advocates—the impression usually left is that the difference in capital expenditure is much greater.

4.—TRAFFIC RECEIPTS.

	Tramways per car mile run.	Motor Omnibuses per omnibus mile run.	Omnibus receipts are—
	d.	d.	
Traffic receipts ...	16·563	20·457	23·5% more than tramways
Traffic receipts per seat provided ...	·307	·608	98% more than tramways
		FARES.	
	d.	d.	Omnibus fare per mile is—
Average fare charged per mile	·652	1·5	130% more than tramways

THE DISCUSSION.

The President.—I am sure you will agree with me that Mr. Fearnley's paper is a very interesting one, and I suggest that it contains a good many points that you will desire to discuss. As a preliminary therefore I will ask Mr. Alderman Russell Taylor to open a discussion.

Alderman B. Russell Taylor (chairman, Liverpool Corporation Tramways Committee).—I have frequently been under the impression that to criticise others' work was a very easy task, but after hearing this paper read, and having previously read it myself, I came to the conclusion that that was a delusion. But before I do attempt to criticise the paper might I say, certainly on behalf of myself, and I think on behalf of this conference, that we welcome Mr. Fearnley's presence here to-day more than we would have done under ordinary conditions, because he has gone through a week of trial which few managers are called upon to endure, and the conclusion must more than recompense him for all the time, trouble, and labour that has fallen upon him and his committee. Gentlemen, the question before us is the address of Mr. Fearnley, and its heading is "Motor Omnibus Services." Might I say at once that whatever my observations may be I hope in turn they will be criticised, because I am sure we have only one object in view, and that is to obtain the right vehicle in the right way. The question of passenger transportation in our great cities is one of the gravest problems that will have to be solved in the near future, and before we come to any definite conclusions it will require a very careful analysis, not only by our managers and engineers, but by the committees who have the control of these undertakings in our cities. I am not a prophet, and one can only be guided by past experience, and that indicates quite clearly the vast possibilities of the motor omnibus. In the years which preceded the war the phenomenal development of the omnibus was much commented upon. It developed with almost alarming rapidity. I do not like to cite London, because London has many advantages over provincial towns in regard to roads, but I do say that the omnibus competes very fully with the more rapid forms of transport in that great city. It has met with popular favour, which is an indication of the future prosperity of the omnibus. I have come to the conclusion that to-day the motor omnibus is a rival, and a very keen rival, to the tramcar, and why? Because of the ever increasing cost that we have to incur on our permanent way and the extra cost that will have to be incurred in the future for the operation of a tramway system. There is another thing which I think ought to receive the very careful consideration of our managers, and that is the great development of the internal combustion engine, which increases its possibilities as to the method of traction to such an extent as to render it a formidable competitor to the tramways. Under these circumstances perhaps it is well, before coming to any decision, to carefully examine the financial possibilities of both forms of traction, and the factors which we are to examine I suggest should be these. First the new capital expenditure required to establish a large system, second the cost of operation, third the comparative life of each system, and fourth the possibility of each system. Regarding the first, it is perfectly obvious that the initial capital expenditure of a tram system is infinitely greater than that of a motor omnibus system. So far as No. 2 is concerned, the cost of maintenance and operation is, so far as our experience in Liverpool shows, very nearly the same. In connection with number three, we must exclude for the moment the construction of the permanent way, underground mains, and overhead construction and merely examine the life of the tramcar as compared with the motor omnibus. There is no doubt to my mind that the life of a tramcar is somewhat longer than an omnibus. The electrical equipment of a tramcar will last ten or twelve years, whilst the engine of an omnibus will not give more than four or five, or possibly six years of useful life. The cost of maintenance of each type will be about the same. The question of the sum involved in the maintenance and construction of permanent way and the large annual sum necessary for sinking fund and repair and renewals enormously handicaps the car system as compared with the omnibus system. The fourth point to be considered is the earning capacity of each vehicle. The seating accommodation in the motor omnibus has been considerably restricted, which places it at a great disadvantage as compared with the tramcar. An Act of Parliament, which is obviously framed for the protection of roads in the control of local authorities against the operation of omnibuses for private gain restricts the omnibus service to such an extent as to render it impossible to obtain the seating capacity which is sufficient to give it the same earning powers as a tramcar, but I venture to say that with the advent of the new Ministry of Transport it is to be hoped that this anomaly will be wiped out and that the omnibus will have a fair chance as a competitor to the tramcar. As matters stand to-day the tramcar undoubtedly has an advantage over the omnibus owing to its larger carrying capacity and consequently greater earning power. In this connection there is another factor which must not be overlooked, viz., that the omnibus, owing to its great mobility, is capable of running a larger number of journeys than the tramcar in a given time. One of the many advantages in connection with its mobility is the fact that its course can be diverted in order to avoid obstruction. This, of course, the tramcar cannot do. It is certainly to be hoped that local authorities will seriously consider the possibility of the omnibus as well as the tramcar, as both can, in my opinion, at the present moment be usefully employed in dealing with the question of passenger traffic in all large cities. With the co-operation of municipal authorities there should be no difficulty in removing all the restrictions connected with the motor omnibus. You will have to consider the great possibilities of the omnibus as a means of providing an express service, and with the development of a more powerful engine there is no reason why the omnibus should not be operated from all the great industrial centres. It would be able to travel much more quickly than the tramcar to suburban districts. Of course I know that the omnibus has its disadvantages as well as its advantages, and this same remark applies also in the case of the tramcar, but the disadvantages in the case of the omnibus can be overcome, and placing one in the balance as against the other,

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I believe that at no distant date municipalities will have more omnibuses than trams. In my opinion it will be absolutely necessary to retain some of our car services in cities and outlying districts, but the omnibus must come forward. We are confronted with many difficulties from which the omnibuses are immune. We are also confronted with difficulties arising out of the war, and there is the question of labour which must be faced. You must not forget the lessons of our experience. Our employees have drifted into other industries, and in some cases inferior men are taking their places. In the running of a tramway system electricity is needed, and the expenses so far as this department is concerned have risen in many cases—coal in particular—300 and 400 per cent. The average cost of all important supplies has gone up by 300 per cent., and the monopolisation to a large extent by the Government of the money market has created high rates of interest for all that is required for tramway working. You have a combination of formidable conditions applied to tramways from some of which omnibuses are immune. My time has passed, but there is one point I should like to mention. Our financial difficulties in my opinion can only be met in one way—not by the taxpayer, but by the farepayer. (Hear, hear.) I have suggested some thoughts for your consideration, for I know the difficulties are great. (Applause.)

Mr. H. Webber (borough electrical engineer and general manager, Keighley Corporation Tramways).—I listened to Mr. Fearnley's paper with very great interest, but I cannot see how any tramway manager can fail to consider every form of vehicle when dealing with this subject. The vehicle I refer to is what you might call half a tramcar—the trackless trolley vehicle.

The President.—May I say that that matter is not under immediate discussion.

Mr. H. Webber.—I am only just mentioning it in passing. In Keighley we ran motor omnibuses in connection with the tramcars as feeders to the tramcars for five years, and our experience—probably our omnibuses were not in as good condition as you can get them to-day—was most unsatisfactory. We abandoned them and took up the trackless trolley vehicle. I do not think we shall ever attempt to take up motor omnibuses again. We in Keighley feel that the trackless trolley vehicle is infinitely better than the omnibus when used in conjunction with electrical tramways. The Chairman has ruled me out of order for bringing this in, but I do not see how any tramway manager can consider this subject without looking at every class of vehicle which can be brought into use, and to my mind it is quite useless to simply mention the tramway car and the motor omnibus without taking into consideration the possibility of an in-between vehicle which will do good service. The cost of petrol is 5d. per mile. We can run a trolley vehicle by electricity, with very nearly equal carrying capacity, at about 1½d., and as an electrical engineer I strongly advocate using up the electricity from the Corporation power-station. What I mean is, that where you have got a big power-station properly equipped you should have a trackless trolley vehicle system, thus making use of the electricity which you have already got. In my opinion some of the big firms, such as Vickers or one of the big electrical firms, should turn their attention to trackless trolley vehicles. If they did so, there would not be much more talk about motor omnibuses as feeders for electric tramways. At any rate, that is my impression after having had experience of tramcars, motor omnibuses, and trackless trolley vehicles. The only reason I got up to speak was to state I do not think it is quite fair to have a discussion on these two classes of vehicles only—tramway cars and motor omnibuses—without turning some attention to a form of vehicle which comes in between, and which every tramway manager must consider in dealing with this subject.

A Voice.—Why did your omnibuses fail?

Mr. Webber.—The reason our omnibuses failed was owing to their undoubtedly heavy cost of upkeep. With the trackless trolley vehicle there are no heavy parts, and consequently very little upkeep. We had all double-deck omnibuses, and nobody rode outside in the winter. We might just as well have had single-deck omnibuses. Another factor worth mentioning in connection with the trackless trolley vehicle is that it is much lighter on the roads. The Act under which the Keighley system is operated restricts the weight to five tons when full of passengers. No restriction of this kind is applied to petrol omnibuses.

Mr. J. B. Hamilton (general manager, Leeds City Tramways).—Mr. Chairman and gentlemen, I think the two last speakers have very clearly indicated the positions they take up in regard to this question. Alderman Russell Taylor said he was an open advocate of the motor omnibus, whilst on the other hand Mr. Webber is a trackless trolley man. Mr. Fearnley's paper has been submitted as the result of practical experience in the operation of omnibuses, and the figures which he has put before you may, in my opinion, be absolutely relied on. I had the honour of submitting to this Association a paper at Sheffield when Mr. Fearnley occupied the position that you, sir, adorn to-day. It was entitled "Urban Transport." In that paper I discussed the relative convenience and costs of motor omnibuses *v.* tramways for city services, and using a little of that imagination with which experts are usually credited with possessing in a superlative degree, I stated the conclusion I came to in 1913, when the results of motor omnibus operation were less definitely tested by experience in their working by municipalities, who publish reliable figures that can be depended upon, I ventured then on the somewhat limited knowledge which was possessed of the costs to predict, and to ask you to accept the conclusion, that the total all-in cost per seat provided, as between the motor omnibus and the tramcar, was exactly double in the case of the omnibus as compared with the tramcar. A reference to the figures quoted by Mr. Fearnley in his paper, where he states that the cost per seat on an omnibus is 114 per cent. higher than on a tramcar, will show that I rather understated than overstated the case. Mr. Fearnley admits that, notwithstanding the utmost economy exercised in obtaining the results he has got from his motor omnibuses, as between the tramcar and the omnibus for busy industrial centres there is no comparison at all. Alderman Russell Taylor, who opened this discussion, said he was an omnibus man pure and simple, but he gave no facts beyond generalisations, nor any figures such as ought to be given in support of his statement that omnibuses should be considered as a vital competitor with tramways. I think he entirely failed to do himself justice as a municipal representative when, dealing with the omnibus *v.* tramcar, he asked you merely to look at the relative capital expenditures. Has it ever occurred to him, or to omnibus enthusiasts generally, that you must have suitable roads to run omnibuses along, and that these roads must be provided by the road authorities? Does he put that in as capital expenditure, or add the loss in assessment for rates as between omnibuses and tramways? Roads do not spring up out of nothing; they have got to be made, and it is now thoroughly certain in the case of the omnibus that unless roads are adapted with a thoroughly sound foundation and a tar-bound surface there is going to be a great deal of trouble not only with the roads themselves but with the vehicles. I think that in speaking of capital expenditure for motor omnibuses the cost of making and maintaining suitable roads must be included, as well as the different assessable potentialities. I have read in the motor press that the omnibus is the cheapest form of transport, but I am afraid that the persons who make those statements have not considered the matter fully or impartially. We find that the actual cost of operating the two classes of vehicles is in the case of the motor omnibus exactly double to what it is in the case of the tramcar. Apart from the economical aspect, there is the question of the public convenience to be considered, and anyone with experience of street transport in large industrial centres must realise that the effort to carry the people by omnibuses *v.* trams is something akin to endeavouring to take your soup with a teaspoon, or shall I say, after last night's experience, your haggis with a toothpick. (Laughter.) You are attempting to meet the peak loads of traffic with a 34-passenger vehicle as compared to a 65-70 passenger tramcar, and find that it is absolutely inadequate for the purpose. Thus the inconvenience to the people you are trying to serve is very great. There is one other aspect to consider this from, but it is so palpable that I need scarcely refer to it. All you gentlemen represent tramway-owning bodies, and you have all got your money spent on establishing those routes. In such circumstances there can be no question as to your future policy. Whilst we are being urged to consider the great possibilities in the development of motor omnibuses, do not forget that there are also great possibilities of improvement to be made yet with regard to tramways. What we should aim at is, by widening our highways, and, where possible, getting the lines laid on separate portions with open construction, to increase the speed of our operation, at the same time lessening the noise. In the possession of a tramway system for serving busy industrial areas you have got the most effective, economical, and reliable method of moving large bodies of people which science and practice has so far evolved. I believe that the real fact is the tramway car, the motor omnibus, and railless traction, all have their suitable spheres for useful service, are all capable of development, and I have no doubt that in the hands of progressive municipalities they will in the future be utilised under appropriate conditions for the better provision of transit facilities to the travelling public. I beg to congratulate Mr. Fearnley, the writer of the paper, on the practical facts he has deduced and for the terse, lucid conclusions, which I fully endorse, at which he has arrived. His contribution is indeed a most valuable one.

Mr. J. Dalrymple (general manager, Glasgow Corporation Tramways).—I cannot criticise Mr. Fearnley's paper because I have had no experience whatever of the motor omnibus, so that I should simply like a little more information, and I should like to ask one or two questions. I might, however, be permitted to express the opinion that the preparation, reading, and discussion of this paper may have very far-reaching results at this juncture. Mr. Fearnley mentions that the fare per mile which he is charging is 1½d. Do I take it that this is a minimum fare charged on the omnibus? I have been looking at the map, and I notice that it does not give us the distances from the centre of Sheffield to the outlying points. It would be of very great service if we had these distances. Mr. Fearnley indicated in his paper that there comes a time or a point when from his experience he would discard the omnibus and introduce the tramway car. Could Mr. Fearnley give us from his long

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experience with the omnibus at what point in regard to population or in regard to omnibus services he would take the omnibus from a certain route and lay down a tramway line? These are one or two points which might make the matter clearer to those of us who have not yet had any experience of the motor omnibus. There is no doubt that many of us are contemplating extensions from our present termini to populations two or three miles further out, and we would like to know if it is worth our while purchasing motor omnibuses to do that service or whether taking the population into account and the likely service required we should lay down a tramway line.

Mr. W. Murray (manager, Walthamstow Urban District Council Tramways).—This is a subject which my Council has been very much interested in during this last twelve months. I want to suggest—and I do not do so dogmatically, because I have no personal experience of a motor omnibus service; but if my theories are wrong they may be corrected by someone else—the suggestion I have in my mind, and I admit candidly I have not yet had time to deal seriously with it, is that, apart from any controversy as to omnibus versus tramcar, there may be an opening for the omnibus for city services in conjunction with and as an auxiliary to the tramcar. Many of us know that at rush times the experience is this—that the tramway either at the terminus or at some leading traffic point gets in these days a heavy overload; but probably by the time it has gone one-third of its way over the journey a considerable number of passengers have left the car, and that depletion continues until, as it approaches the outer terminus, the chances are that it is carrying less than half a load. Now this first of all gives the tramway car a poor loading factor, and, secondly, tends to crowd out the long-distance passengers. What I have in my mind is to see whether we cannot better ourselves with regard to these conditions by an omnibus service, which might be instituted to run an express service probably making three or four stops to the mile, instead of as at present fifteen or sixteen made by the tramcar. I think the result would be that the car would take the short distance traffic for which it is specially adapted, because of the greater carrying capacity and the omnibus would take up the long-distance passengers, giving them an express service, which would be appreciated by them, and we should probably be able to get a bigger revenue from that class of traffic. The advantage with the tramcar is that it can carry a crowd, whereas the omnibus can only carry comparatively few. I think that our tramway fares ought to be revised, and we might institute a new principle in setting up a fare table. In the early days we went to Glasgow for our knowledge, and followed their practice, our idea being to encourage long-distance traffic by making the fares for such relatively cheaper than for short-distance passengers. I am not questioning the wisdom of this, but the times have changed. We always find that at rush times the long-distance passengers are crowded out by the short-distance passengers. I think that incidentally when we come to set up an omnibus service we ought to decide what the proper fare to charge per mile is, and then to carry that out right through, so that if a man pays a penny for one mile the man who travels three should pay 3d. My Council are seriously considering the possibility of running an omnibus service over our present tramway system at rush times, night and morning, with the idea of allowing the tramcars to take short distance passengers, and reserving the omnibus service—which would be an express service—for the conveyance of long-distance passengers.

Mr. Monkson (Stockport Corporation Tramways).—We are about to institute an omnibus service upon a road where it is not convenient to have tramways, and what I should like is some more information as to the cost of petrol-driven vehicles.

Alderman Sir John W. Courtis (chairman, Cardiff Corporation Tramways Committee).—Cardiff is one of the authorities which is considering the question of adopting a motor omnibus system for the purpose of either running on the streets of the city or as an extension of our present tramway system. I should like first of all to pay a compliment to Mr. Fearnley for the excellent paper he has given us, and I have no doubt that this discussion on it will result in our obtaining highly instructive information. Mr. Fearnley has tackled this subject as an expert. He has had great experience in the running of motor omnibuses, and I disagree with the statement which has been made that Mr. Fearnley takes a biased view of the question. He has had to deal with the operation of both tramcars and motor omnibuses. I do not agree with Mr. Russell Taylor in his comparison of the life of a motor omnibus and of a tramcar, which I think is hardly fair to the tramcar. Take our experience in Cardiff. We have tramcars which have been on the road for 17 years, and the cars look as well to-day as when they were first put on the streets. They have, of course, been through the repair and paint shops more than once. He also refers to the weight of the omnibus and suggests that we should increase the length of it in order to carry more passengers. Now, gentlemen, the weight we know is limited, and I think it is a very fortunate thing it is. Everybody who understands anything about omnibuses will know what the results are to the roads on which they run. As a motorist I have always been able to tell where a motor omnibus service runs by the condition of the road. Of course I know that careless driving is responsible for much of the damage done to the roads, but with a more powerful engine, as suggested, the road destruction would be greater. Mr. President, I am quite sure we shall go away from this conference feeling that we have obtained a great deal of useful information on this subject, and I think Mr. Russell Taylor is to be thanked because he has taken up a line of argument quite contrary to his convictions. I think he is a firm believer in tramcars, notwithstanding he has taken the opposite view on this occasion. I am still a firm believer in tramcars, especially when the traffic is heavy, but I am also fully of the opinion that motor omnibuses serve, and will continue to serve, a very useful purpose and will in all probability be more generally used in the future.

Mr. A. Baker (general manager, Birmingham Corporation Tramways).—Mr. President, Sir J. Courtis says he is a firm believer in tramcars. I am a firm believer in any vehicle which will give the best results and meet the requirements of the population. (Hear, hear.) I am reminded by this discussion of the early days of the motor omnibus. I remember in London it was a common thing in the early days to see a motor omnibus standing in the gutter and having to be hauled home, and I remember a cartoon in *Punch*—a horse driver seeing a motor omnibus standing in the gutter leaned over the side of the omnibus and said, "I have been telling you all day to take it home and you wouldn't, now you wants to you can't." I was reminded of that by a very striking feature in Mr. Fearnley's paper. He says that for the week ended August 17, he ran no less than 20,768 miles and he only lost 59 miles in one week. Now, sir, Birmingham is perhaps the biggest municipality owning an omnibus undertaking in this country. We ran 60 motor omnibuses every day, and I can tell you as a matter of actual experience that lost mileage on our omnibuses, notwithstanding the fact that they are getting older—we have been running omnibuses since 1913—is a diminishing quantity and we lose very little mileage. I think that shows that the motor omnibus is becoming more reliable and efficient. I find very little to criticise in this paper. It is a very excellent paper, and confirms very largely the results that we have obtained in our own city. I think, Mr. Chairman, that there is one matter I would like to mention. The Government has always up to recently allowed a period for repayment of motor omnibuses of five years. I was connected with a case a short time ago, and I advised the Cannock Urban District Council, who were seeking motor omnibus powers, to go for a much longer period. I do not see why the whole capital expenditure of motor omnibuses should be written off in five years if you can get a ten years' life. I advised them to go for a ten years' period and I was able to convince the committee that the life of an omnibus was longer than five years, and in the end they split the difference and gave us eight. The repayment period is a point worthy of consideration. Mr. Dalrymple put some very pertinent questions. He usually does. He wanted to know at what point you would do away with an omnibus system and substitute a tramway. We have one route in Birmingham running five miles out into the country as an extension to a tramway. We often have to run there a five minutes' service in the summer months and even then we are unable to accommodate the people. In the evening we sometimes get a queue some hundred yards long, and we have decided that the time has arrived when we should lay down a tramway there, and I think you can take it that if you get a population sufficient to justify a ten or fifteen minute motor omnibus service, then is the time to consider the laying of a tramway.

Mr. R. H. Wilkinson (general manager, Bradford Corporation Tramways).—In the first place I think we ought to thank Mr. Fearnley for his excellent paper—one of the finest that has ever been read to us, and it has been brought forward at a most opportune time. The Bradford tramways have, in addition to the ordinary tramways, 17 railless vehicles operating 9½ miles of route. For the first few months I was very unfavourably impressed with them, as they were constantly breaking down and were most unreliable. If I had given way to that view I might have come forward with views similar to those expressed by the speaker on my left. The trackless vehicle is only in its infancy, and I can see that it can be improved to such an extent both in its seating capacity and working expenses that in time it will become a serious competitor of the tramways. We are limited to a 5-ton maximum weight loaded, which makes it impossible to construct a vehicle carrying 29 passengers strong enough to work satisfactorily and economically. If the restriction regarding weight was removed and covered-in seats provided on the top, it would not materially affect the present working expenses, which are approximately 25 per cent. less than the tramcar. I will now quote costs for operating these vehicles in a similar manner to that used by Mr. Fearnley for his motor omnibuses.

As regards the operation of tramways, I am of opinion that their usefulness could be considerably increased if the average speed of the cars was increased. The great resistance to travelling long distances is time, and if this was reduced a proportionate increase in the number of long distance riders would result. To raise the average speed I would suggest the reduction of stopping places to an average distance of three-quarters of a mile to a mile—(cries of "No, no")—and the introduction of a service of railless vehicles or motor omnibuses along the car routes, with more frequent stopping places to

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cater for the short distance passengers. If the above idea was put into practice at least 75 per cent. of the traffic would be carried on the tramcar, and being the heavier and more commodious vehicle is the best suited for long distance express service. In the country or sparsely populated districts no auxiliary service of railless or omnibuses would be required in addition to the tramcar. Also the long distance fares should be at a lower rate than for short distances.

COMPARISON IN COST OF RAILLESS ELECTRIC TRAMCAR (BRADFORD) AND MOTOR OMNIBUS (SHEFFIELD).

	SHEFFIELD, 1919.	BRADFORD, 1919.
	Average per omnibus-mile.	Average per railless car-mile.
Traffic expenses	7·086d.	5·878d.
General expenses ...	·532d.	·847d.
Repairs account	4·528d.	3·362d.
Road maintenance account	·200d.	·374d.
Power expenses (petrol)	5·550d.	1·509d.
Total working expenses ...	17·896d.	11·970d.

	Tramways per car-mile.	Motor omnibuses per car-mile.	Omnibus expenses are	Tramways per car-mile.	Railless per car-mile.	Railless expenses are
Working expenses ...	12·388d.	17·896d.	44·5% more than tramways	16·542d.	11·970d.	27·6% less than tramways
Service of debt (capital)...	1·688d.	·923d.	45·3% less than tramways	2·675d.	1·500d.	43·9% less than tramways
Total revenue and capital expenditure	14·076d.	18·819d.	33·7% more than tramways	19·217d.	13·470d.	29·8% less than tramways
	Tramways per passenger carried.	Motor omnibuses per pass. carried.	Omnibus expenses are	Tramways per passenger carried.	Railless per passenger carried.	Railless expenses are
Working expenses ...	·716d.	2·137d.	198% more than tramways	1·100d.	1·28d.	16·4% more than tramways
Service of debt (capital)...	·098d.	·110d.	12·3% more than tramways	·18d.	·16d.	11% less than tramways
Total revenue and capital expenditure	·814d.	2·247d.	176% more than tramways	1·29d.	1·44d.	11·6% more than tramways

N.B.—With reference to the capital charges of the railless system, these include the following items :—

Capital of vehicles	£15,212
Capital of overhead equipment ...	12,765
	£27,977

Also a charge of £339 for the year ended March 31, 1919, representing interest and sinking fund for the use of the tramway depots and workshops, tools and plant on the same ratio as is borne by the ordinary tramcars.

7, HALL INGS, BRADFORD,
September 29, 1919. R. H. WILKINSON.

There are instances where the raising of the long distance fares has resulted in a loss of revenue, although the higher fares have effected a considerable increase over the whole system. In the long run it is better for the tramways and the town they serve to have low long distance fares.

Mr. J. M. McElroy (general manager, Manchester Corporation Tramways).—Mr. President, first of all I want to congratulate Mr. Fearnley on the practical nature of this paper. It was gratifying to me to read the paper because Mr. Fearnley and I, over a series of years, have had discussions from time to time on the relative value of tramcars and omnibuses, and I know that he had a distinct leaning to omnibuses, and therefore it was a great satisfaction when I heard his paper giving us after some years of experience the true position that the motor omnibus occupies in the transport industry to-day. A general discussion as to the relative value for transportation purposes of tramway cars, motor omnibuses, and trackless trolley vehicles, is liable to lead us to some wrong conclusions. When we want a machine to do certain work we first of all enquire what the work is before we decide upon the machine. So it should be with transport. We should first enquire into the nature of the loads to be carried before we consider the relative advantages or disadvantages of tramcars, trackless trolleys, and omnibuses. Many local circumstances have to be taken into account before one can dogmatise as to which is the best type of vehicle to adopt. On three occasions we have had this question before the conference. Mr. Hamilton, in 1913, gave us a very excellent and practical paper from which certain conclusions were drawn. In a subsequent year I ventured to speak on this question. Everybody points to the success of the motor omnibus in London, but in London the circumstances are special. The London omnibuses do not attempt to deal with the "peak" loads. The tramcars cater for the "rush" traffic—the omnibuses not turning out before 8 a.m., when the rush is over. Nobody knows what the future has in store for either vehicle. With regard to the suggestion that omnibuses should be run parallel to a tram route, I scarcely think that that is a business proposition. In certain circumstances it might be desirable but I should hesitate very much before adopting it. I am glad that we have had such an excellent discussion.

Mr. W. J. Squires (chairman, Highways Committee London County Council Tramways).—My reason for trespassing on the time of the conference this morning is two-fold. I want the conference to understand that in the absence of my general manager, Mr. Fell, who everyone will regret is debarred from being present by the serious illness of Mrs. Fell, I look upon this matter as one for the technical expert. Everything depends upon the district in which you are going to operate. My experience, of course, is mainly in London, and Mr. McElroy very rightly said that in London the London General Omnibus Company have a free hand to go where they like. In my own particular district of Woolwich, the London General Omnibus Company was used for carrying munition workers to Woolwich Arsenal, but we found out that they did not do it for nothing. They received a subsidy for one year of over £100,000. I believe, and I speak from experience, that there is ample room for both tram and omnibus. The London County Council have made up their minds to seek powers for running omnibuses. Unfortunately their bill this year was turned down, but it is my earnest hope that we may be successful in obtaining omnibuses. We have routes, of course, where omnibuses would save expenditure. I strongly advocate omnibuses, but I do not want to start omnibuses in sheer competition with the London General. If in the provinces your roads are in the same condition as they are in London you will have no difficulty at all; but I suggest that if you make application to run omnibuses and are successful, that you should see that the omnibuses you are going to use can accomplish the work which the road demands of them.

Mr. David Jackson (Liverpool Corporation Tramways).—The outlook in regard to tramways in the view of many gentlemen here is becoming positively awkward, owing to the way in which they congest traffic. In Liverpool everything is held up by the double track. It has become so awkward in Liverpool that we pray for subways. (Laughter.).

MR. FEARNLEY'S REPLY.

Mr. A. R. Fearnley (general manager, Sheffield Corporation Tramways and Motors).—I confess that I am pleased at the way in which the paper has been received. With regard to the criticisms

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that have been made, first of all I think the questions of type of chassis and maintenance could very well be debated at the meeting of our Managers' Section. I do not think that I can rely absolutely on the experience of Mr. Webber in his operation of omnibuses at Keighley, and I say that in no unkind spirit, because he was not responsible for their maintenance. The question of the trackless trolley vehicle was not a subject of the paper. Regarding the point at which it would be wise to put a tramway down, I would not dogmatise, for the reason that it may only be summer or week-end traffic at particular points. The circumstances in each case must be the deciding factor. I agree that in the tram the long distance passenger is certainly at a disadvantage owing to the many stops that have to be made. I am pleased to hear that the London County Council and Walthamstow Council are going to use motor omnibuses in connection with their tramways. I think the speed of the motor omnibus and tramcar is quite fast enough for the public streets, and although I admit I have a very considerable leaning towards the motor omnibus, experience alone must be the great teacher. Mr. McElroy and Mr. Baker struck the right note when they stated that we should be prepared to make use of any class of vehicle which would assist us in our work to meet the requirements of the public in a reasonable way. It is a pity that Birmingham have confined their motor omnibus work to their city and not linked up the outer districts.

On the motion of **The President** a hearty vote of thanks was accorded to Mr. Fearnley for his very interesting paper, and the morning's proceedings then concluded.

THE ASSOCIATION LUNCHEON.

The Association luncheon was held in the Albert Hall, Dundee, with the president in the chair.

Proposing the toast of the Dundee Tramways Committee, **Sir John W. Courtis** (Cardiff) said that Dundee was fortunate in having gentlemen like Mr. Fisher and Mr. Johnston in charge of their undertaking.

Councillor G. A. Johnston (Dundee), in reply, spoke of Dundee's gratitude to Mr. Fisher for the admirable work he had done. He thought the Dundee Tramways Committee was an ideal working committee. Their proposals always got fair consideration and were nearly always approved.

Mr. W. J. Squires (London) proposed the toast of the chairman.

The President, in returning thanks, said he had had a strenuous though very pleasant year of office. These annual meetings, he thought, resulted in great benefit to their respective undertakings, and afforded an opportunity of discussing matters of common interest, and that was an important thing. During the period of the war all managers had been working at high pressure. He was very glad that they had decided that morning to resume the meetings of the Managers' Section next year. He was quite sure that under the new presidency the Association would be as successful in the coming year as it had been in the past.

THE ANNUAL GENERAL MEETING.

The annual general meeting of the members of the Municipal Tramways Association (Inc.) was held in the Albert Hall, Dundee, on Thursday afternoon, September 18, the president (Mr. T. B. Goodyer) in the chair.

The minutes of the preceding annual general meeting were taken as read and confirmed as printed and circulated.

The annual report of the Executive Council (given in full in following pages) and the statement of accounts and balance sheet were submitted and unanimously adopted. Mr. J. Beckett (general secretary) explained that the figures showing the attendance of members of the Executive Council at the various meetings were very inadequate as expressing the time given up by the gentlemen concerned. He had known one single meeting to involve three days from home.

ELECTION OF PRESIDENT.

The President.—Gentlemen, I have now a very pleasant duty to perform, and that is to nominate my successor, and I have very much pleasure in submitting to you the name of Alderman Sir John Courtis, chairman of the Cardiff Tramways Committee. Sir John has long been a member of this Association and has done very useful work. His ability is esteemed very highly on the executive side, and I am sure it is with pleasure that I ask you to accept his name as president for the forthcoming year. You may rely on it that he will carry out the duties of this office with every credit to this Association.

J. M. McElroy W. J. Squires J. B. Hamilton J. Dalrymple A. Baker
H. Mozley Sir J. W. Courtis T. B. Goodyer (*Retiring President*) J. A. Beckett (*General Secretary*) P. Fisher

Some Members of the Executive Council.

Alderman H. Linsley, J.P. (chairman, Salford Corporation Tramways Committee).—I have very much pleasure in seconding that.

The motion was then put and carried with acclamation.

Sir J. W. Courtis.—Mr. President and gentlemen, I appreciate very greatly the honour you have conferred upon me in electing me as your president for the ensuing year, and I have to thank you, Mr. President, for the very kind things you have said about me. I think the members of this Association are aware that I have been a

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member of this Association since its inception, and as chairman of our undertaking at Cardiff I have taken a great interest in all matters appertaining to the welfare of the tramway industry. I am fully conscious of the great responsibility that falls upon a president during his year of office, and this responsibility appears to me to increase as the years pass on. The outgoing president, Mr. Goodyer, was told when he was elected to the office that he had a strenuous year before him, and I have heard the remark already expressed

Sir J. W. Courtis,
President of the Municipal Tramways Association, 1919-20.

that the president for the ensuing year is likely to have, if possible, a more strenuous time, as matters of particular interest to our industry are continually cropping up, which involve a great deal of work, not only upon the President, but upon the members of the Executive Council as well. I can promise you that it will be my endeavour at all times to maintain the good name which has been handed down to me by my predecessors, and if I succeed as well as they have done I shall be quite satisfied. Mr. Goodyer has had a very difficult time during the year which has just closed. You, gentlemen, are well aware that we are now confronted with labour problems from which we hardly know how we are going to emerge. I think from the expressions we have heard at this conference that we are all of one opinion in that the time has come when we ought to make a common stand against the continued demands which labour is making upon our various undertakings for increased wages It is difficult, but we have got to face the situation and do the best we can. I enter the office which you have been good enough to place me in to-day with a certain amount of trepidation, but I am relying upon the support of a good Executive Council. In that respect I think I am particularly fortunate; I know that I can call upon them to support me when the occasion arises. I thank you, gentlemen, very cordially for the honour you have done me. This is not the time for me to say anything about our next conference, but at the appropriate time an invitation will be given you to visit the city of Cardiff. I have no doubt many of you know the city already, but perhaps there are some who do not. Cardiff is the metropolis and capital of Wales. Speaking in Dundee I can say this; in South Wales I might be challenged in putting forward this claim. However, when you do honour us with a visit you will receive a hearty welcome from the Lord Mayor and Corporation.

ELECTION OF VICE-PRESIDENT AND EXECUTIVE.

Sir J. W. Courtis.—It is the privilege of the incoming president to propose the name of a gentleman to fill the position of Vice-president. The name of the gentleman I propose for this office is Mr. G. W. Holford, manager of the Salford Corporation Tramways. We on the Executive Council know the excellent work that Mr. Holford has done, and the many services he has rendered to the Association, and I have the very greatest possible pleasure in proposing that he be vice-president for the forthcoming year.

Alderman E. Russell Taylor (chairman, Liverpool Corporation Tramways Committee).—I have pleasure in seconding that.

The motion was carried with acclamation.

Mr. G. W. Holford.—I appreciate fully the honour you have conferred upon me. It has been a great pleasure to carry out the work. In my office as vice-president it will be my pleasure to assist Sir John if it is necessary for me to assist him, and to give as much time as possible to the work and interests of the Association.

The following gentlemen were elected to fill the six vacancies on the Executive Council:—Lay members—Messrs. Wylie (South Shields) for three years, Higham (Blackburn) for one year. Manager members—Messrs. Barnard (Bolton), Dalrymple (Glasgow), Fisher (Dundee) for three years; Mr. Horsfield (Walsall) for two years.

Alderman A. Priestley (chairman, Bradford Corporation Tramways Committee) formally moved a resolution placing on record the high appreciation of the conference of the services rendered by the Executive Council during the past strenuous year.

Councillor E. H. Sellers (chairman, Huddersfield Corporation Tramways Committee).—I have very great pleasure in seconding that resolution.—This was cordially agreed to.

The President.—On behalf of the Executive Council I desire to thank you for the appreciative manner in which you have expressed yourselves as to the work we have done during the past year.

Alderman E. Russell Taylor (chairman, Liverpool Corporation Tramways Committee) proposed that a hearty vote of thanks be accorded to Mr. T. B. Goodyer for his presidential services.

The President, returning thanks, said: I hope I have made no enemies during my year of office, but on the contrary some new friends. I am pleased that my humble efforts have met with your appreciation. Before I sit down I would like to propose a vote of thanks to my good friend Mr. Holford. No one outside the Executive Council can possibly know the great amount of hard work which he has performed. He has been to me an admirable guide, philosopher, and friend.

Mr. J. McElroy (general manager, Manchester Corporation Tramways).—I have very great pleasure in seconding the vote of thanks to Mr. Holford. It was at my instigation that he was appointed hon. secretary, and the amount of work he put in immediately was enormous. He had almost to leave his own business at Salford, and this Association ought to be very grateful to him.

Alderman J. Bowes (chairman, Manchester Corporation Tramways Committee) proposed a cordial vote of thanks to the Lord Provost (Sir Wm. Don), magistrates, and town councillors of the city of Dundee for their generous hospitality during the Association's stay.

Councillor Kelly (chairman, Glasgow Corporation Tramways Committee), in seconding, said that the delegates and members of the Association had received genuine Highland hospitality.

Mr. G. W. Holford,
Vice-President of the Municipal Tramways Association, 1919-20.

Mr. P. Fisher (general manager and engineer, Dundee Corporation Tramways) returned thanks on behalf of the Dundee Corporation. They in Dundee had been highly honoured by the presence of the Association in their ancient city.

ALTERATIONS IN ARTICLES OF ASSOCIATION.

An extraordinary general meeting was then held when amendments to the articles of association, proposed in the Council's annual report, were agreed to.—The proceedings then concluded.

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EXECUTIVE COUNCIL'S ANNUAL REPORT.

The Executive Council beg to submit the following report of their proceedings since the last annual general meeting :—

I.—Membership.

(*a*) New Members —There have been the following admissions to membership during the year :—

(i.) *Local Authorities* (3).—Edinburgh Corporation Tramways, Liverpool Corporation Tramways (re-admitted), Swindon Corporation Tramways.

(ii.) *Individuals* (8).—W. Chamberlain, general manager, Oldham Corporation Tramways ; W. Forbes, general manager, Aberdeen Corporation Tramways ; G. A. Newsome, general manager, Darwen Corporation Tramways ; C. W. Mallins, general manager, Liverpool Corporation Tramways (re-admitted) ; H. A Goodyer, Coventry Corporation Tramways ; E. W. Cockerlyne, permanent way engineer, Leeds ; V. G. Lironi, tramways engineer, Portsmouth ; J. R. Taylor, general manager's assistant, Walsall Corporation Tramways.

(*b*) Resignations, *nil*. (*c*) Persons no longer qualified for membership, 2.

(*d*) Total Membership.—(i.) Local authorities, 85 ; (ii.) managers and assistants, 116. Total membership, 201.

The total number of local autnorities in Great Britain owning and working tramways is 97, and the total number of local authorities that are members of the Association is 85.

II.—Subscriptions of Members on Active Service.

During the year the Executive Council have continued the policy of exempting from the payment of subscriptions all individual members while serving with the colours.

III.—Chairmanship of the Executive Council.

Mr. T. B. Goodyer, the president, was appointed chairman of the Executive Council in accordance with the amended Articles of Association, and he has occupied the chair at the meetings of the Executive Council during the year.

IV.—Honorary Secretaryship—General Secretary and Central Offices in London.

At the last annual general meeting, Mr. C. J. Spencer (Bradford) relinquished the office which he had held of honorary secretary of the Association, in consequence of his appointment as general manager of a non-municipal undertaking, viz., the London and Suburban Traction Company, Limited, and thereupon Mr. W. Clough, of Bury (Lancashire), was appointed to succeed him. Within a short period Mr. Clough likewise obtained an appointment outside the municipal service which precluded him from continuing in the office. The Executive Council then invited Mr. G. W. Holford (Salford) to occupy the position, and he readily consented to do so until the appointment of a general secretary. The Executive Council take this opportunity of placing on record their high appreciation of his untiring devotion to the progressively onerous duties of the office, and to the interests of the Association in general.

At the last annual general meeting the Executive Council were directed to consider the question of the appointment of a general secretary and staff, and the establishment of a central office for the Association in London, especially in view of the increasing importance and magnitude of the functions of the Association. This subject has occupied their careful consideration, and at a special meeting of the Association, held in London on May 16 last, their recommendations to proceed at once to give effect thereto were unanimously approved. They forthwith invited applications by public advertisement for the position of general secretary. No fewer than 740 gentlemen applied for the position, and, after interviewing seven of the applicants on July 4, they finally appointed Mr. J. Beckett, F.S.A.A., the Borough Treasurer of Accrington, to the position at a salary of £850 per annum as from August 1, 1919. The appointment is a full-time one, and he will be required to perform the duties contained in the Articles of Association and any further additional duties that may be assigned to him from time to time by the Executive Council. He will also discharge the duties of secretary of the Municipal Employers on the new Joint Industrial Council. The necessary staff will be appointed as soon as suitable offices can be obtained in London. The Executive Council is of opinion that this arrangement will meet the necessities of the Association and facilitate its work. It is intended to establish at the central office a library of British and International literature relating to tramways which will be available for members in general.

V.—Annual Subscription.

At a special meeting of the Association held in London in May last it was decided to discontinue the meetings in future of the Municipal Tramways Conference, which had so far been dealing with matters of wages, etc., and that in future this subject would be dealt with by the Association.

It was also decided, in order to meet the expenses consequent upon the appointment of general secretary and the establishment of central offices in London, as well as the expenses of the representatives of the Association on the Joint Industrial Council, to revise the subscription payable by local authorities, and the following scale was adopted, viz. :—

When the annual revenue is—	Annual Subscription.
Under £20,000	10 guineas.
Between £20,000 and £30,000	15 ,,
,, £30,000 and £50,000	25 ,,
,, £50,000 and £100,000	30 ,,
,, £100,000 and £200,000	35 ,,
,, £200,000 and £300,000	40 ,,
,, £300,000 and £400,000	45 ,,
,, £400,000 and £500,000	50 ,,
,, £500,000 and £750,000	55 ,,
,, £750,000 and £1,000,000	60 ,,
Over £1,000,000	100 ,,

VI.—Alterations of Articles of Association.

In consequence of the change in the amount of the annual subscription to meet the financial requirements of the Association, which results from the measures referred to in the preceding paragraphs, it has been deemed desirable to amend the Articles of Association. These amendments will be submitted to the annual general meeting for approval, and afterwards to an extraordinary meeting of the Association for final confirmation.

VII.—Standardisation of Overhead Line Material.

The Joint Committee, the appointment of which was referred to in the last annual report, have continued their deliberations throughout the year, and have devoted a considerable amount of time to this subject. Their recommendations will be submitted to the Association in due course.

VIII.—Wear and Tear Allowances for Income-tax Purposes.

This subject has occupied the attention of the Executive Council during the year, and a special sub-committee has been in conference with the Institute of Municipal Treasurers and Accountants (Incorporated) upon it.

In consequence of the greatly increased cost of renewals and replacements of permanent way, rolling stock, and machinery and plant, and of the high rate of income-tax, this question now stands in the forefront of financial questions affecting tramways. The Executive Council will apply themselves to it during the ensuing year, and take such action in the interests of the Association as may be practicable. The question of the relative advantage of the assessment for income-tax purposes of industrial undertakings, including tramways, upon the three years' average, as against the profits of each year taken by itself, is now occupying the careful consideration of the Royal Commission on the Income-tax. The Executive Council hope to report fully upon this subject at the next annual meeting.

IX.—Tramways : Board of Trade Committee.

The Executive Council were ultimately informed by the Board of Trade that this committee would discontinue their deliberations at the end of February, 1919. Your Executive Council desire to place on record their high appreciation of the assistance rendered by this committee to the various undertakings, and also to the valuable work carried out by them.

X.—Demobilisation of Tramways Employees.

Your Executive Council, in conjunction with the representatives of the Tramways and Light Railways Association and of the employees, have taken steps during the year to hasten the return to civil life of as many of the tramways employees as was possible, and generally the results of their efforts have been satisfactory.

XI.—Standardisation of Gear Wheels, Pinions, and Axles.

At the suggestion of the Tramways and Light Railways Association, your Executive Council elected a sub-committee to confer with them on this subject. The following were appointed as representatives of this Association, viz. :—Mr. A. L. C. Fell, Mr. H. Mozley, Mr. C. Owen Silvers, and Mr. G. W. Holford (hon. secretary).

The work of the conference is still proceeding.

XII.—Lighting of Tramcars.

Your Executive Council were approached by the Board of Trade during the year on the subject of future regulations with regard to the lighting of tramcars.

Messrs. A. Baker and A. L. C. Fell were appointed a deputation to confer with the representatives of the Board of Trade as well as with the Home Office on this subject.

Up to the present no new regulations have been issued by the Board.

XIII.—Rail Corrugation.

The Southern Section of the Rail Corrugation Committee have now completed their report, but inasmuch as an opportunity has not yet presented itself of the matter being considered by the whole committee, the report is not yet available. It is anticipated that in the near future a special report upon this matter will be issued to members.

XIV.—Electric Vehicle Committee.

Mr. A. R. Fearnley, of Sheffield, was reappointed to represent the Association on this committee. At a meeting of the Executive

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Council held in July, 1919, Mr. Fearnley intimated his intention to resign, and thereupon Mr. Mozley was appointed to succeed him.

XV.—Standardisation of Wheels, Axles, Etc.

In consequence of the resignation of Mr. Fearnley as the representative of the Association on this committee, and of an intimation that three members would be welcome, the following gentlemen were appointed, viz.:—Mr. C. F. Craven, Mr. A. L. C. Fell, and Mr. C. Owen Silvers.

XVI.—British Engineering Standards Committee *re* Rails.

The Executive Council were invited to nominate a representative to fill the vacancy on this committee caused by the resignation of Mr. C. J. Spencer, and thereupon they elected Mr. A. L. C. Fell to act with the other two representatives already appointed, viz., Mr. J. B. Hamilton and Mr. J. M. McElroy.

XVII.—Standardisation of Wheel Centres.

During the year your Executive Council received a communication from the secretary of the British Engineering Standards Association, saying that the sub-committee dealing with the above subject had decided to recommend the adoption of the following sizes for wheel centres, viz.:—

(1) A standard driving wheel centre of 27 in., with alternative dimensions of 32 in. or 33 in. over the tread.
(2) A standard pony wheel of 17 in., with a dimension of 22 in. over the tread.

XVIII.—Folding Steps for Tramcars.

During the year a recommendation was forwarded to the Board of Trade stating that in the opinion of the Executive Council folding steps to tramcars are neither requisite nor desirable, and suggesting that the Board should withdraw the clauses in their regulations requiring these to be provided.

XIX.—National Transport Workers' Federation.

Agreement Between the Association and the Federation.

In the early part of the present year an application was received from the National Transport Workers' Federation for a reduced working week for tramways employees and revised conditions of service. This matter was remitted to the Municipal Tramways Conference, but inasmuch as the Council have had to deal with it in its later stages it has been thought desirable to refer to it in this report.

After prolonged negotiations between the representatives of the Tramways Conference, the Tramways and Light Railways Association, and the representatives of the National Transport Workers' Federation, an agreement was reached on March 20, 1919.

After the conclusion of the negotiations the following resolution was passed by the Executive Council, viz.:—

"That the best thanks of the Executive Council be tendered to Mr. A. Baker (Birmingham), the members of the special sub-committee, and Mr. G. W. Holford (the hon. secretary) for their valuable services in conducting the negotiations with the National Transport Workers' Federation, and in bringing the matters at issue to a final agreement."

Pending the establishment of a National Industrial Council, it became necessary to appoint a sub-committee in accordance with the terms of the agreement to deal with matters arising therefrom, and this sub-committee, together with representatives of the National Transport Workers' Federation and the Tramways and Light Railways Association, have held a number of meetings during the year, and dealt with a number of matters arising out of the agreement.

Any future differences, as well as the question of the revision of the agreement, will be dealt with by the projected Industrial Council, after it has been established.

XX.—Joint Industrial Council.

Your Executive Council are pleased to report that during the year the draft constitution of the above Council has been approved by the representatives of this Association, the Tramways and Light Railways Association, and the National Transport Workers' Federation.

The Council will be constituted as follows:—

Representatives of the employers:—The Municipal Tramways Association (Incorporated), 14; The Tramways and Light Railways Association, 8 ...	22
Representatives of the employees	22
	44

The following gentlemen have been elected to represent the Municipal Tramways upon the Council, viz.:—

Area.	*Representatives.*
A. Scotland	Not yet appointed.
B. Northern	Mr. Ald. G. Wylie, chairman, South Shields Corporation Tramways.
C. Lancashire and Cheshire and North Wales	Mr. Ald. Russell Taylor, J.P., chairman, Liverpool Corporation Tramways. Mr. J. M. McElroy, general manager, Manchester Corporation Tramways.
D. Yorks., Lincs., and North Derby	Mr. Ald. Brown, vice-chairman, Leeds Corporation Tramways. Mr. A. R. Fearnley, general manager, Sheffield Corporation Tramways.
E. South Wales	Ald. Sir John W. Courtis, J.P., chairman, Cardiff Corporation Tramways.
F. Midland	Mr. Councillor Lee, chairman, Birmingham Corporation Tramways.
G. Metropolitan	Mr. W. J. Squires, chairman, L.C.C. Highways Committee. Mr. T. B. Goodyer, general manager, Croydon Corporation Tramways.
H. South-west and part of South Coast ...	Mr. Councillor John Owen Roberts, High Sheriff of Gloucester, chairman, Gloucester Corporation Tramways.
I. East, South-east, and part of South Coast	Mr. Councillor Timpson, J.P. (Mayor of Portsmouth), chairman, Portsmouth Corporation Tramways.
J. Executive Council ...	Mr. A. Baker, general manager, Birmingham Corporation Tramways. Mr. J. B. Hamilton, general manager, Leeds Corporation Tramways.

The following gentlemen will represent the Tramways and Light Railways Companies:—

1. Mr. A. H. Beatty ...	Messrs. Balfour, Beatty and Co., 66, Queen Street, London, E.C.4.
2. Mr. W. G. Bond ...	General Manager, Birmingham and Midland Joint Committee, Power Station, Downing Street, Smethwick.
3. Mr. E. H. Edwardes	General Manager, S. Lancs. Tramways, Atherton, Lancs.
4. Mr. H. England ...	General Manager, Yorkshire (W. Riding) Electric Trams, Limited, Belle Isle, Wakefield.
5. Mr. R. J. Howley ...	Chairman, Potteries Electric Traction Company, Manchester Hotel, Aldersgate Street, London, E.C.1.
6. Mr. C. J. Spencer ...	General Manager, 3, Metropolitan Tramway Companies, Electric Railway House, S.W.1.
7. Mr. C. G. Tegetmeier	Chairman, Swansea Tramways Company, Manchester Hotel, Aldersgate Street, E.C.1
8. Mr. W. G. Verdon-Smith	Managing Director, Bristol Tramways and Carriage Company, Clare Street House, Bristol.

The following gentlemen will represent the National Transport Workers' Federation:—

Mr. Robt. Williams ...	Secretary, National Transport Workers' Federation.
Mr. Hugh Lynas (Sunderland)	National Union of General Workers.
Mr. C. Coxsedge (Reading)	National Union of Vehicle Workers.
Mr. T. Merrells (Swansea)	Dock, Wharf, Riverside, and General Workers' Union.
Mr. Ben Smith (London) Mr. W. Anderson ,, Mr. J. Dakin ,,	London and Provincial Union of Licensed Vehicle Workers.
Messrs. Stanley Hirst, N. Bradwell, T. McLean, J. Cliff, H. Allen, A. Tackley, J. Dunnicliffe E. H. Bawden, C. Black, S. Sarsby, R. Powell, E. T. Davies, C. Tilling, D. Paterson	Amalgamated Association of Tramway and Vehicle Workers. (One to be elected.)

The work which the Industrial Council will have to carry out will be of a very important character, and it is anticipated that its establishment will promote harmonious co-operation between the employers and the employees of the various municipal authorities controlling tramways. The first meeting of this Council, convened by the Minister of Labour, was held on September 5, 1919.

XXI.—Ministry of Transport Bill, 1919.

During the year this Bill, which is fraught with important consequences, has been introduced by the Government into Parliament under which it is proposed to establish a new department to deal with the whole question of transport in this country. It is a satisfactory feature that practically the only form of transport (with the exception of docks in general) which the Ministry will not yet interfere with is that of the municipal tramways undertakings of the country. The Executive Council beg to call the attention of members to the remarks made by Sir E. Geddes in introducing the Bill into Parliament. He said:—

"Except in the one bright instance of the municipal tramways, the transportation systems of this country to-day are not prosperous. I will go into details later, but, briefly, this is the position: there are 279 tramways undertakings in the country, of which 96 per cent. are electrified. That is an important point. . . . . It shows that these undertakings are almost entirely modern. Taken all over, these undertakings are earning 7 per cent. on their capital. They are excluded from the Bill."

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Certain powers which have hitherto been exercised by other Government departments will be merged into those of the new department, and there can be no doubt that the effect will be to promote progress and facilitate co-ordination and development to a greater extent than has been the case in the past. It is, of course, difficult at the present time to anticipate what the effect will be upon the various municipal tramways undertakings in the country, but at the present time they are not interfered with by the Bill.

Upon the second reading of the Bill in the House of Lords on July 31 it was proposed that the tramways should be brought within the purview of the Bill. The following is an extract from the proceedings :—

Lord Islington moved an amendment to include in the undertakings under the control of the Minister tramways belonging to local authorities. He said that he did so with the object of eliciting a statement from the Government as to why this most important link in the scheme of national transportation was omitted. The exclusion of such tramways would dig very deeply into the proposals for effective co-ordination, and would create a series of transport anomalies and partialities throughout the country.

The Earl of Lytton said it was true that in the first draft of the Bill powers were asked to take possession of these tramways. He did not think the Government would have any objection if their lordships were once more to place them under their control. Owing to the strong opposition expressed by the owners of the various municipal tramways they consented to put in the words which the noble lord wanted to strike out. He could not hold out much hope, however, that the words, if struck out, would not be reinstated by the House of Commons.

The amendment was, by leave, withdrawn.

Attention is drawn to Clause 5, which provides as follows :—

Power to Grant Through Runnings on Tramways.

"The Minister shall have the power to require through runnings on adjoining tramways belonging to different owners, whether local authorities or not, and in default of agreement between such owners to settle the terms of such through running, after hearing the said owners, in such manner as he thinks fit."

XXII.—Annual Conference.

During the year the Executive Council received an invitation from the Lord Provost, the magistrates, and the Council of the City of Dundee to hold their annual general meeting in that city in 1919, and the invitation was cordially accepted. The Executive Council desire to place on record their hearty thanks to them for their invitation.

XXIII.—The Statutory Undertakings (Temporary Increase of Charges) Act, 1918.

This Act, which was referred to in the last annual report, received Royal Assent on August 8, 1918.

It empowers the appropriate Government department, where it appears that the financial position of any undertaking to which it applies has been adversely affected by circumstances arising out of the war, to modify any statutory provisions regulating the charges to be made by the undertakers. It applies specifically to tramways.

Section 1 (3) enacts that :—

"The undertakings to which this Act applies are (*inter alia*) tramway undertakings, including light railways constructed wholly or mainly on public roads."

The principal provision is in Section 1 (1) (*a*), viz. : —

"Where the undertakers are a local authority, no modification shall be authorised which will increase the statutory maximum charge by more than 50 per cent., or which is more than sufficient, so far as can be estimated, to enable the undertaking to be carried on without loss."

The determination of the question of profit or loss, in view of the fact that the permanent way and equipment cannot be renewed except at considerably increased cost, is not free from difficulty. At least two aspects must be borne in mind :—

(1) That the renewals that have been deferred during the war will now entail the annual provision therefor of a substantially higher rate than is common at present, and consequently a considerably increased burden will be thrown on all undertakings in respect thereof, and

(2) That the admissibility into the accounts of much higher rates of depreciation for all wasting assets will be forced to the front forthwith.

In the judgment of the Executive Council the recognition of the need of ample annual provision for this purpose is of cardinal importance to the soundness and financial stability of the tramway industry, and will loom large in the immediate future. They will therefore be glad to be informed from time to time of the experience of members in relation to it, and to be furnished with concrete examples of renewals cost, so that they may protect their interests.

XXIV.—Depreciation of Buildings—but not Car Sheds.

(The Finance Act, 1918, Sec. 24 (4), and the Finance Act, 1919, Sec. 18).

Attention is directed to the provisions of these Acts, which import a fresh element into relief from taxation by admitting, for the first time, an annual allowance for what is, in effect, depreciation of buildings defined as "mills, factories, or other similar buildings."

A deduction is allowed, in computing the profits assessable under Schedule D, *of the gross assessment under Schedule A.*

Hitherto assessments have not been made upon tramways (in the majority of cases) under Schedule A (commonly known as the "property tax"), and in order to obtain the relief referred to, such assessments must now be made.

Effect is given to the allowance thus :—

Let the assessment under Schedule A be (gross) £600
Then the payment thereunder is upon five-sixths thereof (one-sixth being allowed for repairs, etc.), viz. £500

but the deduction from the assessment upon profits under Schedule D will be *£600, so that £100* represents the allowance for depreciation of buildings. Shortly stated this is the nature of the relief.

The amount of taxation involved for the Association taken in the aggregate is by no means inconsiderable. The allowance does not, however, extend to buildings in which machinery operated by mechanical power is not installed, and therefore car sheds are excluded from the benefit of the allowance. At any rate this is the interpretation at present placed upon the concession by the Board of Inland Revenue.

In the opinion of the Executive Council this discrimination is indefensible, for this reason : That the difference between the actual depreciation of one class of buildings and another, both used industrially, is not one of principle but of length of life. Granted that such buildings do, in fact, depreciate, then there is no satisfactory reason for excluding car sheds.

This subject will receive the attention of the Executive Council during 1919-20.

XXV.—Wages : Arbitrations and Awards.

(*Committee on Production.*)

During the year ended June 30, 1919, three awards were issued by the Committee on Production affecting the wages, etc., of tramways employees.

They are dated July 9, August 29, and November 21, 1918.

XXVI.—Electricity (Supply) Bill, 1919.

This Bill provides for the creation of Electricity Commissioners and District Electricity Boards.

Upon the creation of these Boards it is provided that "all generating stations then existing within the district, other than private generating stations, . . . shall . . . vest in the district Electricity Board," subject to certain terms of purchase named in the Bill.

With regard to the price of electricity, these Boards are placed under an obligation to supply to the authority from which the undertaking is transferred, electricity not less in amount than could have been generated at the generating station by the authority, at a price not greater than that at which it could have been so generated, regard being had, among other things, to any reduction of costs which might reasonably have been expected to accrue from any improvement of the generating station, with a probability of early execution (Clause 7 (5)).

Clause 25 (1), however, provides that : —

"The prices charged by a District Electricity Board for electricity shall be fixed by the Board subject to the approval of the Electricity Commissioners, and shall be such that their receipts on income account will be sufficient to cover their expenditure on income account (including interest and sinking fund charges), with such margin as the Electricity Commissioners may allow."

The effect of this legislation upon municipal tramways undertakings will be followed with great interest, in view of the fact that these undertakings are amongst the largest consumers of electricity in the country.

XXVII.—Road Maintenance Charged Upon Tramways Undertakings.

Attention is directed to the "special report from the Select Committee on Local Legislation" to the House of Commons on July 29, 1919, in which reference is made to the powers obtained during last session by the Walsall Corporation and the Cannock Urban District Council to run motor omnibuses outside their area, subject to certain payments to road authorities. The committee say that they "wish to emphasise the points raised in paragraph 8 of their report in 1914, as to the anomaly of making municipal authorities contribute to the upkeep and reconstruction (of roads), and not making private enterprise do the same. The question of reconstruction and adaptation of roads, particularly main roads, to the needs of modern traffic grows in urgency, and should be dealt with as a matter of national importance, and not in separate local Bills as is now the case."

XXVIII.—The Accounts of the Association.

In Appendix No. 1 will be found the accounts for the year 1918-19.

The total ordinary income of the Association was £386 14 6
And the expenditure £370 16 4

The conference expenses are shown separately.

Signed on behalf of the Executive Council,

T. B. Goodyer, *President.*
John W. Courtis, *Vice-President.*
G. W. Holford, *Hon. Secretary.*
A. R. Fearnley, *Hon. Treasurer.*
J. Beckett, *General Secretary*
(Temporary offices, Gothic House, Accrington.)

August, 1919.

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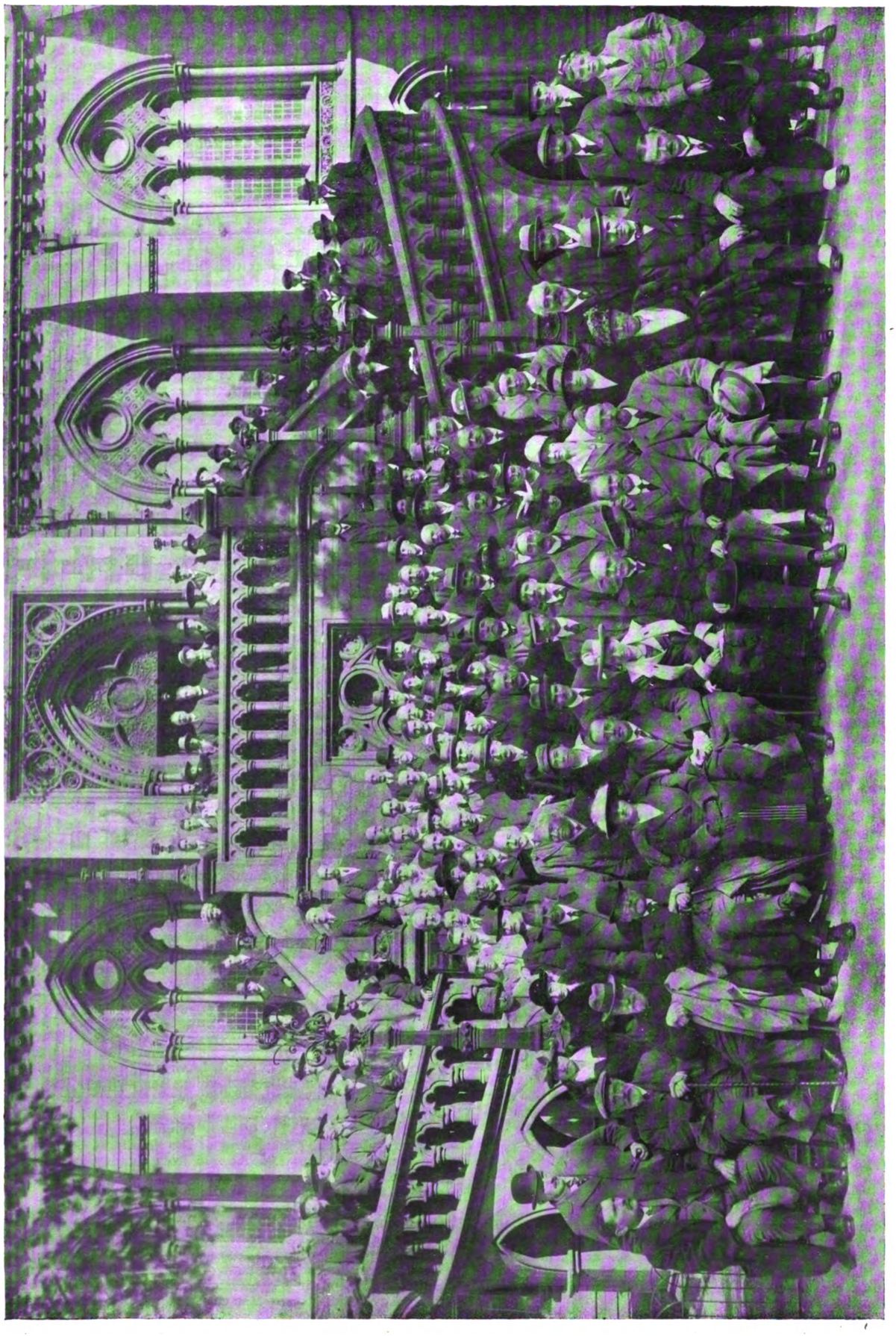

The Municipal Tramway Conference Group.

[Photo. by] [Watt, Dundee.

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DUNDEE CORPORATION BANQUET.

On the Wednesday evening of the conference week the members of the Municipal Tramways Association were entertained to dinner by the Corporation of Dundee, the Lord Provost (Sir William Don, K.B.E.) being in the chair. Over 300 men and women—the ladies also were invited—assembled in the finely proportioned hall of the Albert Institute, which was brilliantly lighted by large candelabra and decorated with the displayed flags of the allied nations. An incident specially interesting to Southrons was the honouring of the "haggis," with traditional ceremony. A lady recited Burns' "Address to a Haggis," and then a lighted dish, preceded by a band of pipers, was borne into the hall and presented to the Lord Provost at the head of the table. He performed the ancient rite of plunging a knife deeply into the haggis, and handed the pipers a glass of whisky. They then completed their march round the hall amidst the skirl of the pipes.

BAILIE BUIST (Dundee) proposed the toast of the Municipal Tramways Association. He said that the Association was now engaged on peace problems, the solution of which he thought would be comparatively easy on account of the intellect and experience of its members. Of all associations he thought the Municipal Tramways Association was one of the most practical. The tramway manager was the target for everybody. It was always upon him that the blame fell. The tramway manager seemed to him to be like the boy who, when he was asked one day by the minister who made the world, confessed that he did it but he wouldn't do it again. The tramway manager bore the whole brunt of the attacks that were made upon him with equanimity, and carried out his work in a quick and quiet manner. Mr. Fisher, their manager, had been connected with the tramway movement for over forty-six years. Touching on the progress of the undertaking, Bailie Buist hoped that in the near future Dundee might be able to develop a motor omnibus service.

The PRESIDENT (Mr. T. B. Goodyer) returned thanks, and said he regretted very much that he did not possess the eloquence of some past presidents to respond to the toast in the manner in which it deserved. He agreed that a tramways undertaking appealed to the public in a way that no other municipal undertaking could or would. He could remember Convener Johnston saying in London some time ago that when the Association came to Dundee, notwithstanding the Scotch characteristics of thrift and canniness, they would find that Scotland knew how to dispense hospitality. (Hear, hear.) He was quite sure that all the members of the Association had tasted Scotch hospitality in Dundee, and had enjoyed it. The city of Dundee had treated the Association quite royally, and they would always have a warm corner in their heart for the great industrial city of Dundee. The Municipal Tramways Association was by no means a mutual admiration society, but very much the contrary. But at these conferences they were able to extend their views and discuss many problems that affected their industry. They were thus able to assist their committees so that the public derived all the benefits from the undertakings in their charge. He thanked them very much indeed for the very kind way in which they had received the toast. (Applause.)

Alderman E. RUSSELL TAYLOR (chairman, Liverpool Corporation Tramways Committee) proposed the toast of the "Corporation of Dundee." Mr. Russell-Taylor said he agreed with Mr. Peter Fisher that in coming to Dundee the Association had come to no mean city. As the civic representative of a city not so well known as Dundee—(laughter)—he appreciated very much what the Corporation were doing here, and what their intentions were. You are truly a progressive city, and although I have the greatest admiration for your tram service, I venture to suggest to Mr. Fisher that if he came to Liverpool there are still one or two things he might learn from us.

Bailie NOBLE said, in reply, that as a native of Dundee he had often wondered why the praises of Dundee had not been more widely sung. He had no doubt that next time the conference came to Dundee they would find the city in a state of even finer perfection. They in Dundee were pleased with the beautiful site that nature had given them, and they looked with eager eyes on the other side of the river, and he ventured to predict that when next the conference met in their city they would have annexed that side as well. He said he agreed that marmalade was the best advertisement that Dundee ever had. He had great pleasure in returning thanks on behalf of the Corporation of Dundee. (Applause.)

CONFERENCE PLAY DAY.

AN EXCURSION TO KINFAUNS.

On Friday, September 19, the programme of the conference was brought pleasantly to a close by an excursion by steamer on the River Tay to Kinfauns, light refreshments being provided by Dundee Corporation. The day was fine, and the visitors much enjoyed the charming views of glen and hillside for which Tayside is renowned the world over.

On returning to Dundee early in the afternoon, the usual conference photograph was taken on the steps of the Albert Hall, and this is reproduced on the previous page.

A LADY'S NOTES ON THE CONFERENCE.

It did not require the chimes of the city clock to ring out every quarter of an hour to tell us how quickly time passes in Dundee. A conference in the "Land o' Cakes" always seems to meet with great approval, in spite of the long railway journey. Of course Dundee needed no introduction—at least to the ladies—for every housekeeper associates the city with its good marmalade, in the same way that when coal—sacred word—is mentioned, one invariably thinks of Newcastle.

Dundee must indeed be a friendly spot to live, move, and have one's being in, judging from its civic representatives, who did all in their power to make our visit memorable. One noticeable feature of this conference was the absence of formality between the ladies. In pre-war days an introduction was almost necessary before one lady would dare speak to another, however much the one might wish to know the other. But the war has changed all that; women could not meet at the various war agencies on anything but a free and easy footing, and now that the ice has been broken heaven forbid that it should ever freeze again. It seems one uninvited delegate caused considerable annoyance to one lady, insisting on sharing her room (probably owing to the lack of hotel accommodation), but the story goes that a small piece of cheese placed judiciously on a trap sent him to his long home.

"Morning dress" on the dinner invitations caused a doubt in some of the ladies minds as to the exact meaning of the words. It was due to this uncertainty that the styles worn were more varied than at former similar dinners. But the voice of the critic was not heard; sensible women, of course, never did worry about their neighbours' wardrobe, and the others do not count. It would be difficult to say which of the excursions and entertainments provided for them during conference hours the ladies enjoyed most. A black list is being prepared (not by the ladies) of those gentlemen who could not withstand the temptation of joining the excursions, but what they lost at the conference was made up to them in the way of fresh air and a feast of scenery. At these excursions, or wherever "two or three" women were "gathered together," the war and prevailing high prices formed the chief conversational topics, and many were the schemes discussed, as, for instance, how to combat the profiteers, the art of camouflaging rhubarb jam to make it represent strawberry, and so on.

Whoever was responsible for "cutting out" the badges at this conference deserves every credit. It would have needed more to justify their existence than the mere fact that they served as passes on the cars. This year the programmes did that, if one wished to take advantage of them. More interest might be displayed in badges were they to bear the name of the town from which the wearer comes. Even if they did this, 80 per cent. would be worn (as before) in the pocket, most people considering that a car and not a coat is the better place for an advertisement. Whether there are two opinions or not about the wearing of badges, there is only one about the 1919 conference. It will go down in the annals of tramway conferences as "one of the best."

Dundee, Broughty Ferry, and District Tramways Company.—The annual report of this company states that the surplus for the year amounts to £5,653, from which there falls to be deducted interest on debenture stock and interim dividends paid on preference shares for the half year, leaving a balance of £3,400, which the directors propose to deal with as follows:—Final dividend on preference shares at the rate of 6 per cent per annum for half year (less tax), and dividend on ordinary shares at the rate of 5 per cent. per annum for year (less tax); to reserve fund, £1,000; to carry forward to next account, £344.

Southport Corporation Tramways.—The annual report of the general manager, Mr. T. J. Kendrew, for the year ended March 31, 1919, shows that the total revenue was £53,491 (an increase of £20,917), and the working expenses, including war allowances, £33,143 (an increase of £14,720), leaving a gross profit of £20,348 (£10,085 last year). After providing for sinking fund, interest and income tax, £1,053 has been appropriated to renewals fund and £2,100 to the aid of rates, while £504 has been applied to the reduction of previous deficits. Factors in obtaining large increases in income include the taking over of the Southport Company lines, the increase in fares and receipts from Sunday running. The average receipts per car-mile were 17·735d. (an increase of 5·740d.) and the average expenses 10·938d. (an increase of 3·374d.). During the past year there have been large increases in wages and a reduction in working hours from 57 to 48 hours per week. The undertaking now has 23 miles of track and 46 cars. This is the first year in which any contribution has been made to the rates, and the general manager remarks that considering the present high price of material and cost of labour it is questionable whether it is wise to continue this policy in the future. The charge for electrical energy has been increased from 1½d. to 2¼d. per mile, less 5 per cent. To improve the condition of the rolling stock 18 trucks, 24 motors, and 3 toast-rack car bodies have been ordered.

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NATIONAL AWARD TO TRAMWAY EMPLOYEES.

The award of the Interim Court of Arbitration under the Wages (Temporary Regulation) Acts, 1918 and 1919, on the application of the National Transport Workers' Federation for an increase of 12s. a week for tramway and omnibus workers in London and the provinces was issued on October 7. It grants an immediate increase of 4s. a week to employees over 18, and 2s. to those under 18. The text of the award is given below :—

1. The parties to this reference are (1) the Conference of Tramway and Light Railway Companies, the Municipal Tramways Association, Dover Corporation, Ipswich Corporation, Colchester Corporation, the London General Omnibus Company, the British Automobile Traction Company, Limited (London Undertakings), the National Steam Car Company, Limited (London Undertakings), and Messrs. Thomas Tilling, Limited (London Undertakings); and (2) the National Transport Workers' Federation and its affiliated Unions providing for tramway and omnibus workers.

2. The claim submitted by the National Transport Workers' Federation on behalf of their members employed by the tramways and other undertakings was as follows :—

> "That for the rates in operation for the several classes of workpeople, there should be substituted rates of 12s. per week in excess of the said rates in the case of employees of 18 years and over, and of 6s. per week in excess of the said rates in the case of employees under 18 years of age."

3. The matter was referred under the Wages (Temporary Regulation) Act, 1918, by the Ministry of Labour to the Court of Arbitration for settlement.

4. After a preliminary hearing on Monday, September 15, 1919, to consider procedure, the court decided to sit successively in London, Bristol, Manchester, and Glasgow, where evidence with respect to the various districts could be submitted. Representatives of the parties were accordingly heard in these four centres on September 23, 24, 26, 27, and 30, and October 2 and 4, 1919.

5. The position of the workpeople in many undertakings is affected by previous awards of the Committee on Production and the Court of Arbitration. Apart from awards confined to individual undertakings, the last award determining war advances was No. 2896 of the Committee on Production of November 21, 1918, which, in respect of a number of undertakings, provided that the advances over pre-war rates should be 30s. a week in the case of men 21 years of age and over and women under an agreement to draw men's wages. The award also provided for an advance to other women of 5s. a week, subject to a maximum of 30s. over pre-war rates, and for an advance of 25s. over pre-war rates in the case of men 18 years and under 21 years of age.

6. By an arrangement dated March 20, 1919, between the Municipal Tramways Conference and the Tramways and Light Railways Association and the National Transport Workers' Federation the working week was reduced to one of 48 hours, inclusive of signing on and signing off, the wages paid for the reduced working week being equal to those received for the number of hours previously worked up to a maximum of 57 hours.

7. During the course of the hearing the court had submitted to them details of the financial position of many undertakings.

8. The court have given careful consideration to the evidence and to the arguments addressed to them on behalf of all parties, and their award is that the additional war bonuses or war advances now being paid to the workpeople concerned who are members of the National Transport Workers' Federation and its affiliated unions providing for tramway and omnibus workers, shall be increased by 4s. a week in the case of those 18 years of age and over, and 2s. a week in the case of those under 18 years of age.

9. This award shall not apply in those cases in which it has been the practice to regulate the wages of those workpeople concerned by movements in the wages of workpeople of a similar class employed in trades or industries other than tramway and motor omnibus undertakings.

10. In the case of the London General Omnibus Company, the British Automobile Traction Company, Limited, the National Steam Car Company, Limited, and Messrs. Thomas Tilling, Limited, the award shall apply only to those grades of employees with respect to whom there are agreements between the companies and the London and Provincial Union of Licensed Vehicle Workers.

11. The rates of pay in force under the Wages (Temporary Regulation) Acts, 1918 and 1919, for the classes of workpeople concerned in the several districts, as modified by this award, shall be the substituted rates of wages of the workpeople concerned for the purpose of such Acts.

12. This award shall take effect from the beginning of the first pay period following October 1, 1919.

WILLIAM W. MACKENZIE.
JOHN M. DENNY.
F. S. BUTTON.

G. T. REID, Secretary,
5, Old Palace Yard, S.W.1,
October 7, 1919.

FINANCIAL REPORTS AND MEETINGS.

BRAZILIAN TRACTION LIGHT AND POWER CO.—A quarterly dividend of 1½ per cent. has been declared on the fully-paid cumulative preference shares.

MADRAS ELECTRIC TRAMWAYS.—The directors have declared interim dividends on the preference shares of 6 per cent. per annum, less tax, and on the ordinary shares of 8 per cent. per annum, free of tax.

BOLCKOW, VAUGHAN AND COMPANY.—The directors have decided to pay a further dividend on the ordinary shares for the year ended June 30 last of 8 per cent.

G. D. PETERS AND COMPANY, LIMITED.—The quarterly dividend at the rate of 6 per cent. per annum, less income tax, will be paid on the preference shares of the company for the quarter ending September 30, 1919, to all shareholders whose names appear on the company's register on September 20, 1919.

WALSALL CORPORATION OMNIBUSES.—The 1918-19 accounts of the Walsall Corporation omnibuses show an income of £28,000, which gives an average of 18·981d. per omnibus mile, compared with 17·979d. the year before. The expenditure was £21,748, and represented 14·927 per mile, as against 12·915d. A sum of £6,278 was carried to net revenue account.

THE METROPOLITAN-VICKERS ELECTRICAL EXPORT COMPANY was registered on September 19 with a capital of £100,000 in £1 shares to carry on the business of dealers in, and exporters of, electrical plant and machinery. The first directors are Sir E. W. Smith, John E. Hutton, Horace Lloyd, and R. S. Hilton. The registered offices are at 2, Westinghouse Buildings, Norfolk Street, London.

KALGOORLIE ELECTRIC TRAMWAYS.—After providing for interest and sinking fund on the "A" debenture stock and charging interest (not paid) on the "B" debenture stock, the accounts for 1918 show that the debit balance of £30,519 brought down was further increased to £36,519. This debit balance of £36,519 was arrived at after charging interest to date on the "B" debenture stock, which was in arrear as at December 31, 1918, to the extent of £40,500.

BRADFORD CORPORATION TRAMWAYS.—The report of the general manager (Mr. R. H. Wilkinson) for the year ended March 31, 1919, which has been issued, states that notwithstanding the difficulties a fairly efficient service was maintained throughout the year, and with the prospect of deliveries of new cars and equipment in the near future there is every reason to hope that the efficiency of the service will gradually improve. Before the undertaking can be restored to its pre-war efficiency, however, further expenditure on cars and equipment, and repairs and renewal of track will be necessary. For this purpose a strong reserve fund should be accumulated. We append a comparative summary of the year 1918-19 with the two preceding years and the year 1913-14.

	1918–19.	1917–18.	1916–17.	1913–14.
INCOME—	£	£	£	£
Traffic revenue	456,818	366,495	326,406	297,019
Sundry receipts	10,025	10,414	7,185	8,724
Total income	466,843	376,909	333,591	305,743
EXPENDITURE—				
Traffic expenses	133,094	115,793	99,722	82,842
General expenses	32,287	28,438	27,128	27,184
Repairs and maintenance	90,661	64,725	46,506	56,214
Power expenses	55,765	52,981	52,514	50,378
Miscellaneous expenses	6,024	5,836	4,529	4,201
Total working expenses	317,831	267,773	230,399	220,819
War allowances	27,702	22,231	14,352	—
	345,533	290,004	244,751	220,819
Balance carried to net revenue	121,310	86,905	88,840	84,924
Profit from Parcels Dept.	—	791	311	1,059
Interest, etc.	4,278	2,266	1,167	3,878
	125,588	89,962	90,318	89,861
Less—				
Loss on railless system*	2,036	513	585	1
Loss on Parcels Department	102	—	—	—
Deductions—				
Interest	22,062	21,553	20,255	20,443
Income tax	14,452	10,193	10,693	3,888
Rents	3,492	3,502	3,693	4,259
Net profit	83,444	54,201	55,092	61,270
Appropriated as follows—				
Sinking fund	22,617	22,825	24,289	31,822
Relief of city rate	—	10,000	3,400	17,200
Reserve, renewals, etc.	60,827	21,376	27,402	12,248
	83,444	54,201	55,092	61,270
Mileage of track	108¾	108¾	108¾	106
Car mileage	4,925,822	5,534,858	5,728,982	6,206,239
Units per car-mile	2·094	2·101	2·018	1·894
Traffic receipts per car-mile	22·257d.	15·892d.	13·674d.	11·486d.
Power cost per car-mile	2·717d.	2·297d.	2·200d.	1·984d.
Traffic revenue per mile of single track	£4,201	£3,371	£3,002	£2,792
Expenses per car-mile	16·542d.	12·322d.	10·063d.	8·376d.
Passengers carried	76,419,459	84,129,252	77,074,546	67,675,166
Fare per passenger	1·482d.	1·079d.	1·049d.	1·058d.
Ratio of expenses	75·88%	78·32%	75·12%	73·13%
Number of cars in stock	232	233	234	245

* Loss on working.

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PERSONAL.

Mr. C. B. Simpson has joined the board of directors of Mather and Platt, Limited.

Mr. G. A. Newsome, manager of Darwen Corporation Tramways, has been granted an increase in salary to £350.

Lieut.-Col. Sir Rhys Williams, Bt., D.S.O., K.C., M.P., has been appointed Parliamentary Secretary to the Ministry of Transport.

Capt. Henry Kernick, Cardiff, has left for Singapore to take up the post of manager of the Singapore Electric Tramways Company.

Mr. R. R. Blake has been appointed general manager of the Gravesend and Northfleet Tramways and the North Kent Motor Omnibus Services.

Sir William Mitchell Thomson, M.P., and **Lieut.-Colonel the Hon. Arthur Murray, D.S.O., M.P.,** have been appointed directors of the North British Railway Company.

Sir William H. Clarke, K.C.S.I., C.M.G., Controller-General of the Department of Overseas Trade, has resumed his duties after a prolonged absence owing to ill-health.

Mr. S. T. Allen, borough electrical engineer of Wolverhampton Corporation, has been granted an honorarium of three hundred guineas and an increase of £200 per annum in salary.

Alderman James Bowes, for eleven years chairman of the Manchester Tramways Committee, has received a gift from his colleagues in celebration of the seventieth anniversary of his birth.

Mr. Arthur Brown, city engineer of Nottingham, proposes to retire from his office, which he has held for almost thirty-nine years. He will be retained as consulting engineer to the Corporation.

Mr. A. Anderson, general manager of the Oldham, Ashton, and Hyde Electric Tramway Company, has left Denton and taken up a similar post under the British Electric Traction Company at Peterborough.

Professor Dobson, D.S.O., general manager of the gas, electrical supply, and tramways department of the Johannesburg Municipality, has resigned because, it is alleged, the remuneration for the work was quite inadequate.

Mr. Evans, traffic superintendent of the Newport Corporation Tramways, has been granted an increase in salary to £312 per annum, by the unanimous vote of the committee, as some recognition of the splendid work he has done.

Messrs. C. P. Sandberg intimate that their London address is now 40, Grosvenor Gardens, London, S.W.1. The cable and telegraphic address will remain as before, but the telephone numbers are Victoria 6877, 6878, and 6879.

Mr. J. I. Newell, electrical superintendent, British Columbia Electric Railway Company, has taken over the duties of the hydro-electric engineer, succeeding Mr. F. S. Easton, who recently resigned in order to join the Mexican Light and Power Company.

Mr. Charles Aldington, C.B.E., has been appointed a member of the Railway Executive in the place of the late Mr. Frank Potter. Mr. Aldington will be the representative on the committee of the Great Western Railway, of which Mr. Potter was general manager until his death.

Mr. H. O. Davis has resigned his position as manager of the publicity department of John I. Thornycroft and Company, Limited, in order to take up an important appointment with Vickers, Limited. He will still continue to act as honorary secretary to the Society of Motor Advertising Managers.

Mr. J. H. Wilkinson, tramway electrical engineer of Hull, has resigned his position to commence business on his own account under the name of Joseph Wilkinson and Company, consulting electrical engineers, and is dealing with light railway and tramway work and electric vehicles.

Mr. Wm. Billington, general manager of the Wigan Corporation Tramways, has resigned. The Corporation Tramways Committee propose to allow him six months' salary in lieu of notice, and express the hope that his health, which has been the cause of his resignation, will be improved.

Mr. J. Makins has been appointed general manager and electrical engineer of Bexley Urban District Council Tramways at a salary of £700 a year, in succession to Mr. H. P. Stokes, who recently accepted a similar position at Plymouth. Only about a year ago Mr. Makins was appointed mains superintendent of Bexley undertaking at a salary of £300.

Professor Joseph Ernest Petaval, D.Sc., F.R.S., M.I.Mech.E., has been appointed director of the National Physical Laboratory in succession to Sir Richard Glazebrook, C.B., F.R.S., who retired on reaching the age limit on September 18. Professor Petaval is Professor of Engineering and Director of the Whitworth Laboratory in the University of Manchester.

Mr. J. Beckett, formerly borough treasurer of Accrington, who recently commenced his duties as general secretary of the Municipal Tramways Association, has been presented by the Corporation officials of Accrington with an English gold lever watch and gold albert. At the presentation the Town Clerk, the Borough Engineer, and the Chief Constable spoke in appreciation of Mr. Beckett's services to the borough.

Mr. C. W. Mallins, general manager of the Liverpool Corporation Tramways, recently tendered his resignation to the Tramways Committee, stating that for reasons of health he felt compelled to ask the committee to release him from the position, which he had held for the past fifteen years. At a special meeting of the committee it was unanimously resolved to request Mr. Mallins to withdraw his resignation for the present, and to accept three months' leave of absence in order to take a complete rest.

Mr. W. Tuke Robson, who recently resigned the management of Southampton Corporation Tramways, sailed for America on the "Mauretania" on October 15, to study American and Canadian tramway practice. Mr. Robson will be pleased to undertake any commission or inquiry on his tour, which will include the principal tramway systems and engineering centres in the United States and Canada. Mr. Robson may be addressed care of THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2

Mr. A. Douglas Ingram has joined the firm of Messrs. Alfred Ingram and Co., railway material contractors, Queen Anne's Chambers, Westminster, S.W.1. After serving with the Engineering Unit of the Royal Naval Division in Gallipoli, Mr. A. Douglas Ingram was appointed as an assistant engineer, Ministry of Munitions, Manchester, and at the time of the armistice was secretary of the engineering department of the N.W. Area, Manchester. His training as an electrical and mechanical engineer on the Metropolitan Railway well fitted him for these positions, and will serve him in good stead in the position he has now taken up.

Mr. R. McKean Cant, F.C.I., advertising manager of the B. F. Goodrich Company, Limited, is conducting a class in advertising and salesmanship in Queen's Road Senior Commercial Institute, Dalston, London, E.8, every Tuesday evening this session from 7.30 to 9.30, beginning on Tuesday, September 23, and also a class in the same subjects in Highbury Commercial Institute, Laycock Street, Upper Street, Islington, N.1, every Wednesday evening this session from 7.30 to 9.30, beginning on Wednesday, September 24. A copy of the prospectus of the particular Institute concerned can be obtained either from Mr. Cant or from the Principal of the institute most convenient for the student.

Mr. H. Campion, manager of the Dewsbury Municipal Electricity and Tramway Departments, had been appointed to a similar joint position under the Chesterfield Corporation, at a commencing salary of £600 per annum. Mr. Campion succeeds Mr. R. L. Acland, who resigned to take up an appointment with a London transport company. Forty-four years of age, Mr. Campion has been in his present post at Dewsbury for close on eighteen years, and previously he held appointments under the Blackburn Corporation and the City of London Electric Light Company. **Mr. W. A. Toppin,** who has been acting as manager of both undertakings since Mr. Acland's resignation, has been appointed assistant general manager at a salary of £300 per annum, plus £120 per annum war bonus.

Mr. Theodore P. Schonts, who since 1907 had been president of the Interborough Consolidated Corporation, which controls the greater part of the various tube railway services, the elevated electric railways, and the tramcar lines in New York City, died in New York on September 21.

Mr. James Blake Concannon, of 98, Piccadilly, S.W., and of Rockfield, Athenry, Galway, Ireland, a member of the firm of J. B. Concannon and Company, stockbrokers, 28, Austin Friars, E.C., chairman of the Anglo-Argentine Tramways Company, and a director of the Brisbane Electric Tramways Investment Company and the Brisbane Tramways Company, who died on August 12, aged 69, has left a fortune of the value of £133,700, the net personalty amounting to £126,392.

BUSINESS NOTES.

Messrs. Dunford and Elliott (Sheffield), Limited, steel manufacturers, have opened their own offices in London at 4, Copthall Buildings, Copthall Avenue, E.C.2. The general management of the London office is in the hands of Mr. Ivor S. Winby, who has hitherto controlled Messrs. Dunford and Elliott's export business, whilst the services of their London agent, Mr. E. St. Clair Duncan, are retained in the capacity of sales manager.

Peacock Brakes.—It may interest readers to know that the number of "Peacock" brakes manufactured and sold in the United Kingdom exceeds 9,600. Owing to the great difficulty for months past in obtaining a sufficient quantity of malleable iron castings, late deliveries have been inevitable. The Peacock Brake Company is doing its best to meet the situation, and suggests that every intending buyer of "Peacock" brakes or parts should order as far in advance of their requirements as possible. Mr. J. McI. Cater informs us that the postal address of the company is now 43, Kensington High Street, London, W.8. Telephone number, "Western 355"; telegraphic address, "Inbrake, Kens, London."

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CONTRACTS AND ORDERS.

Vickers, Limited, have an order from Ayr Corporation for a rotary converter at £2,119.

The English Electric Company, Limited, are building three new electric cars for Darwen Town Council.

Liverpool Corporation have ordered 5,500 tons of Sandberg silicon-sorbitic steel tramway rails from Walter Scott, Limited, of Leeds.

The Glasgow Numerical Printing Company, Limited, have an order for the supply of tickets for three months from Glasgow Corporation Tramways.

Walthamstow Light Railway Committee have placed an order for 20 tons of steel tramway rails with Walter Scott, Limited, at a price of £21 10s. per ton.

Heston and Isleworth Urban Council have accepted the tender of the General Electric Company for a 500-K.W. rotary converter and transformer and cable work at £7,925.

Bolton Tramways Committee have accepted a tender by the English Electric Company, Limited, for eight bogie car electric equipments and four spare motors.

Salford Tramways Committee have accepted the tender of Hadfields, Limited, at £573 for steel tie bars, and of W. T. Glover and Company, Limited, at £338 10s. for light cable.

Liverpool Watch Committee have decided to accept the tender of Leyland Motors, Limited, for a petrol motor fire engine for £1,660, delivery to be made in six months' time.

Preston Tramways Committee have accepted the tender of Messrs Hadfields, Limited, of Sheffield, for the supply of points and crossings for the Lancaster Road Junction, for the sum of £1,098.

Wallasey Tramways Committee have recommended the acceptance of a tender for the supply of six motor omnibuses at £1,515 each. The routes inside and outside the borough on which they will be used are under consideration.

Bradford City Council have accepted the following tenders:—Babcock and Wilcox, Limited, three water tube boilers with superheaters, stokers, etc.; Peter Brotherhood, Limited, one cooling tower and chimney for existing cooling stack.

Sandberg "In Situ" Treatment of Rails.—Messrs. Scholey and Company, of 56, Victoria Street, London, S.W.1, the licensees and contractors for this patent for increasing the durability of tramway rails "in situ," have received an order for treatment of track from the Newcastle Corporation.

New Cars for Belfast.—The Belfast Corporation have accepted the tender of the English Electric Company, Limited, of Queen's House, Kingsway, London, W.C., for the equipment of fifty cars, at £31,770. The order for the car bodies and trucks was recently placed with the Brush Electrical Engineering Company, Limited, of Loughborough.

Prices of Rails and Fishplates.—In consequence of the increase of prices during the war, Newcastle Town Council have agreed that a memorandum should be endorsed on a contract dated February 27, 1915, with Walter Scott, Limited, for the supply of rails and fishplates, substituting for the original price of £9,362 the sum of £21,488.

Southend Corporation Light Railways Committee have considered the specifications received from the Brush Electrical Engineering Company, Limited, for the supply of six large double-deck top-covered cars and one "toast rack" car, with Brush electrical equipment, at prices amounting to £17,880, and resolved that these be approved, and the company be instructed forthwith to proceed with the construction of the cars.

Salford Tramways Committee recommend accepting the tender of Bolckow, Vaughan and Company, Limited Middlesbrough, for the supply and delivery of 500 tons of Sandberg silicon steel tramway rails, at the price of £19 per ton, amounting to the sum of £9,500 (exclusive of the royalty payable to Messrs. Sandberg); and for the supply and delivery of 250 pairs of steel fishplates for tramway rails at the price of £25 per ton, amounting approximately to the sum of £157 10s

American Electrical Plant for Cape Town.—A report from Cape Town dated August 30 states that the City Council have reluctantly decided to place an order with the General Electric Company of America for new electrical plant to the value of £28,278. Several British tenders were received, and the difference in price was not considered material. British tenderers were, however, unable to offer an early delivery, and as the plant is urgently required to avert a threatened breakdown of the electric system, the Council felt compelled to accept the American offer.

Track and Car Renewals at Bournemouth.—The Corporation intend to re-lay a portion of the tramway lines, at an estimated cost of £184,000, and to purchase new cars at a cost of £60,000. A proposal to institute motor omnibuses instead of trams has not been favourably received.

TRAMWAY AND LIGHT RAILWAY NOTES.

AYR.

TRACK RENEWAL.

The borough engineer has reported that he estimates the cost of track renewals at £53,900. The Council have asked Mr. Ferguson, the engineer of the Glasgow Corporation Tramways, to examine the track and to advise to what extent the rails should be renewed and in what order the work of renewal should be proceeded with.

BELFAST.

CLAIMS OF THE CAR BUILDERS.

At a meeting of Belfast Town Council, a deputation representing local trades unions interested in tramcar building was received. It was pointed out that the repair work to be done was absorbing all the available labour and material in the city, and that the cars were needed immediately. The Council agreed, however, that cars would be built in Belfast as soon as the arrears in repairs had been dealt with.

BIRMINGHAM.

LIGHT RAILWAY TO QUINTON.

The Corporation have applied to the Board of Trade for a further prolongation to September 6, 1920, of the period authorised for the construction of the Quinton Light Railway under their order of 1912, and for the compulsory purchase of lands. The construction of this line was held up by various causes, in particular the war.

BRADFORD.

THE CARRIAGE OF GOODS.—HIGH POWER CAR MOTORS.

Bradford Corporation are considering the carriage of goods on the tramways, and are ascertaining what can be done in the direction of extending the carrying powers already granted to various tramway authorities. The idea is to use wagons equipped with electric motors taking power from the overhead wires. The wagons would also be fitted with storage batteries, thus enabling them to leave the tramway route and deliver goods within a certain radius of the tramway lines. About five years ago, Mr. C. J. Spencer, then general manager of the Bradford Corporation Tramways, first put in service wagons of this kind, and their use has been found advantageous. In the report of the general manager (Mr R. H. Wilkinson) it is mentioned that the high power car motors which were ordered early in 1915 from Messrs. Brown, Boveric and Company had not been delivered, and the older motors had proved unequal to carrying the heavy traffic. Due to the overloading of these motors there had been an extraordinary number of failures, and the greatest difficulty had been experienced in obtaining material and labour to maintain sufficient cars in service. Twenty-six new cars with high power motors of modern design have been ordered, together with 52 pairs of motors and electrical equipment, which will replace the older motors. The Corporation has 232 tramway cars and 17 railless trolley vehicles.

DOVER.

COST OF THE ACCIDENT IN 1917.

The compensation expenses in connection with the accident on the Dover Corporation Tramways on August 12, 1917, owing to the overturning of a car, which resulted in the death of 11 persons and injury to 61 others, are reported at £14,575. A special rate of 1s. 6d. in the £ will be required, in addition to the £1,000 insurance received.

DUBLIN.

AN APPEAL TO THE BOARD OF TRADE.—HOUSING AND TRANSIT.

The secretary of the Dublin United Tramways Company has informed Pembroke Council that he regrets the service to Sandymount via the Bath Avenue section could not be restored, but steps were being taken to augment the service to Sandymount via Ringsend. The Council have resolved to appeal to the Board of Trade and to consult their legal adviser as to what could be done to compel the company to repair the roads. Dublin Corporation, after discussing the loan offered by the Development Company of Ireland for housing purposes, resolved to ask the company to place £1,000,000 to the credit of the Corporation at once, in order that the housing plans already decided upon may be undertaken forthwith. The total sum required for housing in Dublin is stated to be £12,000,000, and this sum may be raised by the loan in question later on. The scheme is likely to necessitate extensions of the tramways.

EDINBURGH.

ANOTHER EDINBURGH TO QUEENSFERRY SCHEME.

Edinburgh Tramways Committee have deferred consideration of a proposal to construct a tramway to Queensferry by way of Kirkliston. It will be remembered that two or three years ago a scheme for a tramway to the same place by a more direct route was dropped.

GLASGOW.

SUPERANNUATION FOR EMPLOYEES.

In view of the superannuation scheme proposed by the Corporation for their tramway employees, a mass meeting of tramway workers was held on September 24, and a deputation representing various sections appointed to confer with the Council Committee on the subject.

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GREENOCK.

THE PROPOSED PURCHASE OF THE TRAMWAYS.

At a meeting of Greenock Town Council on September 18, it was moved that the clerk be instructed to give notice to the Greenock and Port Glasgow Tramways Company that the Corporation have decided to exercise their option to terminate on May 15, 1921, the lease of the company at the second break which occurs on that date. By a large majority an amendment was carried that no action be taken until the members had before them the report of the committee which was enquiring into the matter.

LANARKSHIRE.

COMPANY'S OFFER TO SELL THE TRAMWAYS.

In reference to the proposed purchase by the county and burgh authorities of the undertaking of the Lanarkshire Tramways Company, the secretary has informed the authorities that the expenditure on the undertaking (excluding the County Council's lines) has amounted to approximately £460,900. To construct and equip a similar undertaking to-day would involve an expenditure of at least £1,000,000. The average rate of dividend paid has been 6·2 per cent. since the company began operations, and 7 per cent. for the period from January 1, 1914, to date. Subject to the approval of the shareholders, the company are prepared to dispose of the undertaking to the County Council for £463,050; and the compensation of the directors and officials for the loss of offices either by a payment of £12,000 or on the lines of the Belfast Tramways Act—the transfer to be made on December 31 next.

LONDON.

RAIL DELIVERY DIFFICULTY.—TRAMWAY DIRECTION SIGNS.—NO SEASON TICKETS.—PURCHASE OF L.U.T. CARS.—ST. PANCRAS ACCIDENT.

Having failed to obtain quotations for early delivery of British tramway rails, and not desiring to purchase rails from the U.S.A., the East Ham Corporation have appealed to the Labour Ministry to assist in securing delivery from British makers. For the convenience of passengers, illuminated tramway direction signs are to be placed on lamp-posts in the vicinity of the tramway termini of the City of London. Mr. A. L. C. Fell, general manager of the London County Council Tramways, reporting with reference to an oft-repeated suggestion that season tickets should be issued, has stated that as conductors would only be able to see the covers of such tickets, the system would lend itself to fraud. The Council have agreed that season tickets be not issued. Walthamstow Light Railways Committee have received delivery of six of the eight second-hand tramway cars which they had agreed to purchase from the London United Tramways, Limited. The committee have recommended the Council to purchase an additional four cars from the company at £570 per car. At the resumed inquest on September 13, in connection with the tramway accident in Pancras Road, Mr. H. S. May, rolling stock superintendent of the L.C.C. tramways, said the brakes of the car were in good condition. In his opinion, a driver would be justified in approaching the place where the accident occurred at a speed of 16 miles an hour. Travelling at 16 miles, the driver would need to apply the brakes about 100 ft. from the place at which he wished to stop. The inquest was adjourned until September 20, when the jury brought in a verdict of "accidental death." They were of opinion that the driver was in no way responsible, and complimented him on having stuck to his post till the car was overturned. They were further of the opinion that the speed of cars travelling down the curve to the corner of Great College Street should be reduced considerably from the speed hitherto prevailing.

MAIDSTONE.

WOMEN CONDUCTORS V. DEMOBILISED SOLDIERS.

Maidstone Corporation have informed the local branch of the Demobilised Sailors' and Soldiers' Association that they cannot comply with the demand that tramway conductresses should be dismissed and their places filled by discharged soldiers at a minimum wage of 50s. a week. Compliance would increase working costs, and involve higher fares. The Light Railways Committee have decided to present the women employees who are leaving the service with certificates. The tramway employees entertained the women employees at a supper on September 10, when the tramway service was stopped at 8.30 p.m.

MANCHESTER.

GREAT SCHEME FOR TERMINALS, NEW ROADS, AND WIDENINGS.—PASSENGER SHELTERS.

Outlines of a scheme of tramway extensions, estimated to cost between one and two million pounds, have been submitted by the Tramways Committee for inclusion in the Improvements Bill to be promoted by Manchester Corporation in the next session in Parliament. The proposals comprise widenings of old streets, the making of a network of new roads, and the construction of terminals to relieve congestion at central points in the city. A joint committee of the tramways and public health departments has agreed on plans for the construction of shelters. Two islands with covered shelters will be provided in Hanging Ditch, one shelter at the Grand Lodge entrance to Heaton Park, waiting rooms and public conveniencies at the junction of Bury New Road and Waterloo Road, a shelter, etc., at the corner of Old Road and Wilson Street, and an improvement scheme with shelter at the junction of Slade Road and Stockport Road. Progress is being made with the scheme already passed for a shelter outside the Lake entrance to Bellevue, and plans are under consideration for the corner of Lloyd Road and Stockport Road, Levenshulme, and the terminus at Palatine Road and All Saints.

SALFORD.

A SHELTER FOR PASSENGERS.

Having instituted the queue system to relieve congestion of passenger traffic at Victoria Bridge, the Tramways Committee propose to erect a shelter for waiting passengers at that point.

SUNDERLAND.

EXCHANGE OF RUNNING POWERS.

After long delay and a considerable amount of agitation locally, Sunderland Tramways Committee have recommended the Council to adopt the principle of running powers in connection with the District Tramways Company.

TEESIDE.

TRANSFER OF THE RAILLESS TRACTION UNDERTAKING.

Representatives of the Middlesbrough Corporation and the Eston Urban Council met at Middlesbrough on September 22 as the Teeside Railless Traction Board. Mr. J. T. Bell, clerk to the Eston Council, reported that it had been arranged that the transfer of the undertaking to the constituent authorities of the board should take place on October 22. Seven cars are now ready and test trials have proved entirely satisfactory. A Board of Trade inspection would, however, be necessary before the service could be inaugurated.

WALLASEY.

PROPOSED CHEAPER TICKETS.

The Tramways Committee have instituted a system of issuing books of tickets, whereby 13 penny tickets are sold for a shilling, and 13 three-halfpenny tickets are sold for 1s. 6d. When the minutes of the committee came before the Council, it was proposed that the books of tickets should be sold at a reduction of 2d. on the shilling, but the proposal was negatived.

INCREASES IN FARES.

Dundee Town Council have agreed to an increase in the tramway fares. Over the longer distances the increase will be a halfpenny. It was mentioned that for the current year the estimated working expenses showed an increase of £15,000, of which £12,000 was wages. Since pre-war days the wage bill had gone up by £30,000.

Birkenhead Tramways Committee propose a further increase of fares. The minimum is to be 1½d., and the average per mile will be a like sum.

Hull Corporation have referred back for further consideration a proposal by the Tramways Committee to abolish halfpenny morning fares.

Blackpool Tramways Committee propose to increase the fare on the circular route from 4d. to 6d.

Yorkshire (Woollen District) Electric Tramways Company have increased all 1d. fares, except on one route, to 1½d.

In connection with the increases of fares proposed by Paisley District Tramways Company, the Town Council has agreed to concede the minimum of a penny for the first mile in the case of ordinary fares, but to press for the retention of the children's half-penny fare, the workmen's half fare be insisted on, and that arrangements should be made for the workers' cars being run in the morning from 6.30 to 8 o'clock to suit the new hours of working, and also that the proposed extra charge on holidays and Sundays be opposed.

Stalybridge, Hyde, etc., Joint Tramways Committee, owing to the increased cost of coal and shorter hours of labour, have decided to discontinue single fare workmen's tickets.

York Tramways Committee have recommended that the 1d. fare on the omnibuses be increased to 1½d.

Walsall Tramways Committee have made the following increases in fares:—Halfpenny on each class of ticket on the tramways and 1d. on the motor service tickets, excepting the 1d. fare, which has been increased by ½d.

Burnley Tramways Committee have decided that owing to the advance in their employees' wages an increase in fares has become inevitable.

A report to the Halifax Corporation Tramways Committee shows that if the present expenditure is continued, and there is no increase in revenue, there will be a deficit on the year's working. Wages alone show an increased expenditure of about £52,000 per annum. The committee have decided to apply to the Board of Trade for powers to increase fares.

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DIARY OF THE MONTH.

FROM MONDAY, SEPTEMBER 1, TO TUESDAY, SEPTEMBER 30.

MONDAY, SEPTEMBER 1.

Aberdeen Corporation Tramways Committee decide not to be represented at the conference between employers and employees in the tramway industry, at London, on September 4.—Bradford Corporation Tramways Committee take steps to establish a goods service with electric wagons.—Blackpool Tramways Committee are unfavourable to the demands to be discussed at the National Conference to be held in London on September 4.—Greenock Town Council decide to defer purchase of the tramways of the District Tramways Company for further inquiry.—Fares on London Underground Railways increased on certain routes.—St. Annes Council offer £140,000 for the section of the Blackpool, St. Annes, and Lytham Tramway within their jurisdiction.—Belfast Corporation receive a deputation from local car-builders, and agree that cars will be built locally as soon as circumstances permit.—Bradford Corporation considers a scheme for conveying goods on the tramways.

TUESDAY, SEPTEMBER 2.

Tramway Committees of Dundee, Hull, and other important municipalities decide to support the Municipal Tramways Association in opposing the demands of the tramway workers to be considered at the conference of September 4.—Mass meetings of tramway workers are held at Manchester, Birmingham, Glasgow, and other towns, and pass resolutions urging the men's representatives at the joint conference in London to hold out for their full demands.—Wallasey Corporation Tramways Committee recommend acceptance of tenders for supply of six motor omnibus bodies at £1,515 each.—York Corporation Electricity and Tramways Committee accept tenders for cast-iron pipes and valves from local firms.—York Corporation Tramways Committee make arrangements for reinstating demobilised workmen, and decide to increase omnibus fares.—A man is fined £5, with an alternative of 30 days' imprisonment, at Glasgow Central Police Court, for assaulting a tramcar conductor.—Sheffield tramway workers hold a meeting, and resolve to hand in strike notices, to take effect on Wednesday, September 11, unless their demands are complied with.

WEDNESDAY, SEPTEMBER 3.

Sir Eric Geddes sends a circular letter to the chairmen of London, Middlesex, Surrey, Kent, Essex, and Hertford County Councils, asking that representatives be nominated to an advisory committee by those Councils.—Edinburgh Corporation Tramways Committee considers a scheme for a new line of tramways and postpones action for further enquiry.—It is stated that Rotherham tramway workers have agreed to join with Sheffield men in the proposed strike.—Glasgow Corporation Tramway Department employees hold a mass meeting, and resolve to approach the executive of the Transport Workers' Federation, asking that leave be granted for taking a ballot on the question whether a strike should be declared to enforce the demands they have made.

THURSDAY, SEPTEMBER 4.

Special conferences of the Municipal Tramways Association and the Tramways and Light Railways Companies held at the Surveyors' Institute, London, at which it is agreed that the demands put forward by the Transport Workers' Federation be referred to the Ministry of Labour.

FRIDAY, SEPTEMBER 5.

Sir Robert Horne, Minister of Labour, meets representatives of the Municipal Tramways Association, the Tramways and Light Railways Association, and the Transport Workers' Federation, at the Ministry of Labour.—First meeting of joint industrial council for the tramway industry held at the Ministry of Labour.

MONDAY, SEPTEMBER 8.

Carlisle Town Council renew the licence of the tramway company for a year, but call attention to the bad condition of the track and overcrowding of the cars.—Southport Tramways Committee decide to continue the higher scale of fares till September 27.—Dundee Corporation Tramways Committee receive a deputation of employees specifying claims in regard to holiday, gratuities, and uniforms.—An omnibus overturns at Dulwich, and one woman passenger is killed.—Increased fares put in force at Wallasey.

TUESDAY, SEPTEMBER 9.

Alderman Meyer reports to York City Council that the motor omnibus services of the Corporation show a loss.—Paisley Town Council make recommendations to the Paisley District Tramways Company regarding increases in fares.—On the motion of Mr. Robert Smillie, the Trades Union Congress censure the Parliamentary Committee for refusing to convene a conference to consider "direct action."—Sir Charles Parsons addresses the meeting of the British Association at Bournemouth on "Engineering and the War."—Portsmouth Tramways Committee decide that no contribution from the tramway surplus can be given in relief of rates.—Manchester Traffic Congestion Committee and Tramways Committee hold a conference.—Estimates are put before Ayr Town Council, showing that renewals and doubling of tracks proposed will involve an expenditure of over £50,000.

WEDNESDAY, SEPTEMBER 10.

Sheffield City Council, after hearing the statement of Sir William Clegg, chairman of the Tramways Committee, resolve to refuse the Sheffield tramways workers' separate demands and to abide by the decision of the national arbitration award.—Tramway strikes in Egypt continue, but the strikers offer to return to work if they are paid for the period of the strike.—The Trades Union Congress at Glasgow decide to support the demand of the miners for nationalisation of the mines.

THURSDAY, SEPTEMBER 11.

Sheffield tramway workers strike, all the car services of the city being suspended.—Cardiff Trades Council recommends that the tramway fares of Cardiff be revised.—Rotherham tramway employees join in the Sheffield strike.—Glasgow Town Council approve of the action of the Tramways Committee in agreeing to submit the claims put forward by the tramway employees to arbitration.—The head of a tramcar trolley pole breaking falls and injures a man on the head, while the car was taking a curve on the L.C.C. Camberwell route.—At the Trades Union Congress, the decision on the question of "direct action" is evaded by the passing of a motion for the previous question.

FRIDAY, SEPTEMBER 12.

At a mass meeting of Sheffield tramway workers telegrams are read from the Trades Union Congress, the Transport Workers' Federation, and the Tramway Workers' Union, urging them to return to work, but the meeting pass a resolution to remain on strike.—Nice tramway workers on strike vote on whether or not they should return to work, but the urn containing the votes is overturned and another vote has to be taken.—Wishaw Town Council defer consideration of purchase of the Lanarkshire Tramway Company's undertaking, holding that the company is asking too much money.

SATURDAY, SEPTEMBER 13.

Marseilles tramway workers join in the strike of municipal workers.—Rawmarsh and Parkgate Trades Council hold a meeting to hear Mr. Gibson, deputy town clerk of Sheffield, explain the Sheffield City extension scheme.—Mexboro' tramway workers join in the Sheffield tramway strike.—Sheffield tramway strikers hold a demonstration.—Inquest on the victims of the St. Pancras tramway accident resumed, and finally adjourned.

MONDAY, SEPTEMBER 15.

Halifax Corporation Tramways Committee decide, in view of the unsatisfactory financial position of the undertaking, to apply to the Board of Trade for permission to charge increased fares.—A preliminary meeting of the Court of Arbitration on the tramways dispute held at Old Palace Yard, Westminster.—A Luton Corporation tractor driver is fined 20s. for failing to notice the signals of the tramcar driver, and causing a collision between the tramcar and the trailar of the tractor.

TUESDAY, SEPTEMBER 16.

Edinburgh Corporation Tramways Committee again postpone commencing operations on the extension of the tramways to Corstorphine.—Pontypridd Council decide to apply for Parliamentary powers to extend their tramways to Rhydfelin and Upper Boat.—Two L.C.C. tramcars collide and cause injury to three women passengers.—Sheffield tramway strike ended, the men returning to work on the old scale.—It is definitely announced that the arbitration on the tramway workers' claims will be national in scope, but that evidence will be heard in London, Bristol, Glasgow, and Manchester, opening in London on Tuesday, September 23.—Glasgow Corporation Tramways Committee announce that no extensions of the system can be undertaken for a year, labour and materials being wholly absorbed in repairs and renewals.

WEDNESDAY, SEPTEMBER 17.

Eighteenth annual conference of the Municipal Tramways Association opens in Dundee, Mr. J. B. Goodyer presiding.—A carman is fined £2 for wilfully obstructing the passage of a tramcar in Leicester.—Rotherham tramway workers return to duty.—South Shields Corporation tramway employees make presentations to fellow-members of the staff who had won distinction in the war.—Supplementary award to vehicle workers by the Court of Arbitration is issued.—Six cases of obstruction by drivers of horse vehicles on Sheffield Corporation Tramway routes are considered at the local police court; the first case tried is dismissed, and the other five charges are withdrawn.—The Egyptian tramway strike settled by compromise.—Barnet magistrates decide that all passengers must leave tramways at a terminus, but advise further investigation into the question.—Pontypridd Town Council decide to extend the Corporation tramways.

THURSDAY, SEPTEMBER 18.

Annual conference of the Municipal Tramways Association resumed. Sir John Courtis elected president, and G. M. Holford vice-president for the ensuing year.—Greenock Town Council reject a motion to open negotiations for acquiring the Greenock and Port Glasgow Tramways.—A tramwayman receives an electric shock at New Cross, London.—Grimsby and Immingham transport workers, on strike about three days, return to work.

FRIDAY, SEPTEMBER 19.

Annual conference of the Municipal Tramways Association concluded at Dundee.—Belfast motor drivers demand a minimum wage of £3 per week.—Newcastle Corporation Tramways Committee propose to extend the tramway lines over the High Level Bridge and to connect with the Gateshead system.

SATURDAY, SEPTEMBER 20.

At the inquest on the two men killed near St. Pancras Station, the jury return a verdict of accidental death, and compliment the tramcar driver.—Tramway strike declared at Santiago.—A general strike of ironmoulders declared.

MONDAY, SEPTEMBER 22.

Tees-side Railless Traction Board meet.—Powers of the Board of Trade transferred to the Ministry of Transport.—London-Brussels

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air service opened.—Edinburgh Town Council remits to the Tramways Committee to consider the advisability of establishing chars-a-banc services on certain routes.

TUESDAY, SEPTEMBER 23.

Interim Court of Arbitration on the claims of the tramway workers for higher wages holds its first sitting.—Barrow Town Council take steps to acquire the tramways of the town from the British Electric Traction Company.

WEDNESDAY, SEPTEMBER 24.

Mass meeting of employees of the Tramways Department of Glasgow Corporation held to consider proposed superannuation scheme.—Stoke-on-Trent Town Council decide to purchase the undertakings of the Potteries Electric Traction Company.—Glasgow Corporation Wages Committee advise the Town Council to refuse tramway men's demands.—Interim Court of Arbitration of the Ministry of Labour hold a sitting at Bristol.

THURSDAY, SEPTEMBER 25.

A public meeting is held in York, calling for a better service in certain districts of the city.—A London County Council tramway car takes fire, but the passengers escape without injury.—Terms of purchase by the Stoke-on-Trent County Borough Council of the Potteries Electric Tramways Company's undertaking, for the sum of £737,800, published.—An order constituting a light railway in the parishes of Little Sutton and Netherpool, Cheshire, issued.—Morecambe Town Council confirms the agreement with the Lancaster Tramways Company for the purchase of the tramways undertaking.—Brighton Town Council refuse to sanction the extension proposals of the Tramways Committee.

FRIDAY, SEPTEMBER 26.

Ipswich Corporation Tramways Department estimate a saving of £1,000 a year by re-arrangement of routes.—Interim Court of Arbitration hold a sitting in Manchester and take evidence.—National railway strike begins.

SATURDAY, SEPTEMBER 27.

Railway services of the country practically suspended, though a few trains are kept running.—Tramway Workers' Federation Executive offer to co-operate with the railwaymen by striking, but advised to delay.—A conference of unions affiliated with Tramway Workers' Federation held, but no decision of moment made.—Tramcar at South Shields gets out of control on a hill and causes injury to 15 passengers and other damage.—Supply of tickets on one of the South London tramway routes runs out.—London United Tramways partially stopped owing to the electricians at the power-station joining the railway strike.—Sitting of Interim Court of Arbitration held at Glasgow.

MONDAY, SEPTEMBER 29.

Liverpool Corporation Tramways system held up by a breakdown in the electric current supply, the stoppage lasting about an hour.—Numerous passenger services by road instituted, and a limited service on the London Underground Railways resumed by the aid of volunteers.—Meeting of Transport Workers' Federation rendered abortive, because the delegates from northern towns are unable to attend.—Manchester Improvements Bill approved by the City Council.

TUESDAY, SEPTEMBER 30.

Resolution passed by Liverpool Branch of the National Union of Railwaymen, protesting against Liverpool Corporation tramway fares.—London County Council Tramways held up on Thames Embankment by a slight mishap.—Meeting of Transport Workers' Federation held, but no resolution given out.—Interim Court of Arbitration resumes sitting in London.

RAIL HARDENING AND ARC WELDING.

BRITISH ASSOCIATION MEMBERS WITNESS THE PROCESSES.

On the afternoon of September 9 the members of the Engineering Section of the British Association at Bournemouth witnessed two interesting demonstrations at the tramways depot, where the members were received by I. Bullin, Esq., B.A., A.M.Inst.C.E., the general manager and engineer. First the "Insitu" process for increasing the durability of tramway rails was shown. A description of the process and its possibilities was given by the inventor, Mr. C. P. Sandberg, M.Inst.C.E., and it was evident from the subsequent discussion that the practical possibilities of the process were appreciated by the gathering, which included a number of eminent metallurgists. The demonstration which followed consisted of the treatment of a length of rail under ordinary working conditions, after which the rail was fractured, revealing to the naked eye a depth of treatment of about a quarter of an inch. Automatic punch tests indicated that the Brinell hardness number of the rail had been raised from 200 to over 500. The length of time the members devoted to discussing the process, the encouraging expressions of opinion, and the absence of adverse criticism, form a clear indication that the process has received a cachet from the scientific world. The other item Mr. Bullin had arranged consisted of an interesting exhibition of the arc welding process. A heavy job in the form of a broken lug on a motor casing was very successfully repaired, and an interesting demonstration was given of the use of a new manganese steel electrode designed on entirely original lines. The results obtained were very successful, and marked a great step in the welding and depositing of this special steel. The whole of the electrodes, including the special manganese electrode, were supplied by Alloy Welding Processes, Limited, 149, Leadenhall Street, E.C.

PATENT LIST.

Abstracted for "The Tramway and Railway World" from the Official Journal of Patents.

***** If the inventions have been communicated the names of the communicators are given in italics.**

APPLICATIONS FOR LETTERS PATENT.

The number of the patent is given in brackets.

SPECIFICATIONS PUBLISHED.

Locking devices for change speed, brake, etc., levers (20,873)—T. W. E. Anderson.

Automobiles (21,394)—Associated Equipment Company, A. S. Colling, and C. K. Edwards.

Hand operated brakes for tramcars (21,344)—W. Bardsley.

Rail for tramways and railways (20,808)—K. Bellis.

Steering gear (21,290)—Baron H. E. E.V. Bliss and Clarke, Chapman and Company.

Friction driving gear (21,084)—E. W. Bowen.

Motor vehicles (20,903)—Castle Motor Company and S. Goodwin.

Change speed gear for motor cars (21,355)—J. H. C. Faire.

Variable speed gear (21,275)—J. F. Farris.

Safety circuit breaker for overhead tramway wires (20,901)—A. L. Findlay.

Locking device for steering wheels of motor cars (20,988)—F. Garner.

Producing gradual drive and change of speed in motor cars (20,859)—L. Gillot.

Variable speed gear and clutch mechanism (21,200)—P. Johnson.

Lifting jacks (21,375)—C. Leese and O. Solberg.

Electric cable mountings for use on motor vehicles (21,272)—R. W. Maudslay.

Steering mechanism for automobiles (20,962 and 20,963)—W. W. Parsons.

Automatic steerage of motor vehicles (20,836)—A. H. Rowan.

Speed gear changing and reversing mechanism (21,300)—W. C. Stevens.

Electrical systems for preventing collisions on single line railways (21,991)—D. J. Akhoona.

Motor vehicles (21,792)—E. S. Alexander.

Shock absorber for power transmission systems (21,599)—A. Alltree.

Electrical equipment of motor vehicles (21,957)—R. L. Aspden and F. H. Bowman.

Sustaining or supporting appliances for motor vehicles (21,416)—F. W. Baker.

Automatic electric couplings (21,897 and 21,898)—R. Belfield (*Westinghouse Air Brake Company*).

Internal combustion engines for motor vehicles (21,434)—A. E. Berriman and Daimler Company.

Obstruction remover and guard for front wheels of mechanical road vehicles (21,935)—E. H. Clark and F. D. Clark.

Direction indicators for road vehicles (21,985)—H. J. Droc.

Brakes for motor vehicles (21,433)—J. H. C. Faire.

Change speed gear for motor vehicles (21,537)—J. H. C. Faire.

Power transmission gears (21,654)—H. G. C. Fairweather (*Svenska Turbinfabriks Aktiebolaget Ljungstrom*).

Lifting jack operated by pneumatic pressure (21,504)—G. C. Frier.

Motor vehicles (21,764)—L. C. Humfrey.

Electric signalling for railways (21,523)—J. Hunter.

Change speed gears (21,535)—S. C. Johnson.

Locking operating levers for automobiles (21,959)—H. S. Jones.

Lifting jacks (21,907 and 21,908)—A. E. Lake and others.

Variable speed friction gearing (21,481)—R. H. McHardy.

Change speed gearing (21,886)—H. A. Major.

Driving steerable wheels of motor vehicles (21,931)—L. E. de Mole.

Change speed gear for motor vehicles (21,511)—J. S. Page.

Life guards for wheels of motor vehicles (21,454)—L. G. Palmer.

Steering control lock (21,911)—T. M. Payne.

Attachment showing whether motor car engine exhaust is delivering smoke (21,878)—A. O. Pictet.

Brake mechanism (21,800)—L. Raymond.

Motor vehicles (21,560)—F. M. T. Reilly.

Train controlling arrangements (21,742)—E. Smith.

Electric signalling systems (21,415 and 21,514)—Western Electric Company (*Western Electric Company*).

Electric transmission systems and cables therefor (21,624)—Western Electric Company (*Western Electric Company*).

Tire brakes for motor vehicles (22,255)—P. B. Bausch, F. F. Pershke and Price Service and Company.

Transmission gearing (22,097)—F. W. Berwick and Company and M. H. L. Sizaire.

Electrically operated lifting jack (22,162)—F. W. Berwick and Company and M. H. L. Sizaire.

Pulleys for trolley poles of electric tramcars (22,114)—G. A. Bishop and R. A. Chadwick.

Locking apparatus for steering wheel of motor cars (22,260)—J. J. Bourne.

Motor wheels (22,503)—W. C. Brinton.

Trolley guide for electric tramcars with overhead system (22,445)—E. S. Cattell.

Motor vehicles (22,435)—E. W. Cleveland.

Brake mechanism (22,089)—E. T. Dallow and Industrial Appliances, Limited.

Means for locking electric switches of ignition circuits of motor vehicles (22,554)—S. E. M. Gilbert.

Means for locking change speed lever of motor vehicle (22,464)—A. F. Glover.

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Lifting jacks (22,549)—C. A. Jones.
Motor vehicles and engine mountings for same (22,048)—E. S. Marlow.
Electro-magnetic braking apparatus for electric railway, etc., vehicles (22,247)—G. L. Meyfarth.
Power transmission for propelled vehicles (22,182)—J. M. Munroe and C. W. Whitham.
Device for indicating excess of certain speed of automobiles (22,280)—S. Opeschkin.
Means for locking steering gear of automobiles (22,502)—R. C. Smith.
Securing devices for control levers of automobiles, etc. (22,327)—W. R. F. Thomas.
Electric tramways (22,090)—C. H. Watkins.
Railway and road vehicles, and draught, coupling, and buffing appliances therefor (22,264)—H. A. Wheat.
Automobiles (22,086)—C. H. Wills.
Motor vehicles (22,170)—E. S. Alexander.
Safety guards for wheels of motor vehicles (23,033)—A. D. Barry.
Device to lock steering wheel of motor car (22,815)—W. H. Beament and T. H. Wheeler.
Train speed controlling apparatus (22,781)—R. Belfield (*Westinghouse Air Brake Company*).
Power transmission gearing (23,205)—D. Benda and R. Whittle.
Motor vehicles (23,137)—J. G. Bouillon.
High speed electric locomotives (22,798)—British Thomson-Houston Company and F. W. Carter.
Variable speed and reverse gears (22,705)—A. E. Buck.
Variable gearing (23,180)—E. S. Chandler and J. B. S. Poyser.
Steering wheel for motor vehicles (23,040)—C. A. Chapman.
Fluid pressure braking apparatus (22,648)—J. W. Cloud.
Spring suspension of motor vehicles (22,824)—R. B. Coleman.
Tramway and railway vehicles (22,855)—A. G. Crimp.
Differential gearing (22,657)—G. C. Goodhart.
Steering gear for motor vehicles (22,650)—J. Hamilton.
Motor vehicles (22,870)—A. G. Hanvey.
Change speed gearing (22,672)—G. E. Lillie.
Vacuum brakes for railway vehicles (23,124)—E. S. Luard.
Pressed steel wheels for automobiles (23,070)—N. B. Ludlow and G. W. Watson.
Variable speed power transmission (22,742)—H. Morley.
Lifting jacks for motor vehicles (23,011)—C. Pether.
Protection of live rails in electric traction (22,655)—A. Raworth.
Variable velocity ratio gearing for motors (23,147)—J. M. Rubury.
Vacuum brakes (23,007)—A. B. Sharp.
Friction clutches for motor cars (22,962)—C. M. Shaw.
Change speed gears for motor cars (22,963)—C. M. Shaw.
Chassis for motor cars (23,043)—C. M. Shaw.
Trollies or current collectors for electric tramways (23,209)—T. J. Smeddles.
Differential driving clutch for rear wheels on motor vehicles (23,212)—T. A. Swindell.
Driving gear for motor cars (22,986)—G. W. Wadden.
Point levers for railways, etc. (22,974)—D. D. Williams.
Combination steering device (22,873)—G. W. Young.
Device for driving or propelling motor vehicles (23,145)—V. Zboril.

1918.

Speed indicating devices (1,761—*130,367*)—G. Constantinesco.
Tires (10,691—*130,440*)—Dunlop Rubber Company and C. Macbeth.
Electro-magnetic speed changing gear (12,315—*119,651*)—Menco-Elma Syndicate.
Apparatus for the propulsion of vehicles and for the prevention of skidding (12,472—*130,464*)—E. Bullock Webster.
Driving gear for motor vehicles (14,294)—*130,498*)—G. Woodvine.
Road wheels of automobiles (10,952—*130,719*)—F. W. Baker.
Electric traction systems employing a centre gripping rail (12,670—*130,741*)—G. N. Fell.
Motor road vehicles (12,902—*130,774*)—F. J. Osborn.
Axle boxes (14,617—*130,823*)—A. A. Shepherd.
Mounting of recording instruments and engine control devices on motor vehicles (18,014—*130,858*)—G. W. A. Brown and Arrol-Johnston, Limited.
Differential gear (18,068—*130,860*)—J. W. Docherty.
Heat treatment of tramway rails (7,752—*131,096*)—W. M. Mordey.
Wheels of motor road vehicles (9,554—*131,102*)—E. F. Goodyear.
Current collectors for electrically propelled vehicles (13,105—*131,136*)—R. H. Wilkinson and A. R. Fearnley.
Rigid coal gas container for compressed gas for motor vehicles (13,338—*131,155*)—E. J. Buckingham.
Bearings or mountings for steering wheels of motor road vehicles (17,115—*131,205*)—W. J. Thomas and E. G. Wrigley and Company.
Transmission mechanism for motor-driven vehicles (19,594—*122,822*)—R. D. Nuttall Company.
Traffic signalling devices (21,654—*131,227*)—P. J. Foy.
Variable gear for motor vehicles (13,362—*131,431*)—H. Taylor.
Continuous automatic fluid pressure brakes for railway and like vehicles (18,257—*131,515*)—J. C. Taite (*A. M. Bell.*)

1919.

Change speed gears for motor vehicles (7,691—*130,567*)—J. Milne.
Motor road vehicles (1,745—*130,891*)—A. A. H. Tisserant.
Variable speed and reversing gear (10,491—*130,944*)—J. F. Wollesen.
Route indicators for use on road vehicles (3,352—*131,235*)—O. E. Joseph.
Lifting jacks (8,957—*131,254*)—J. J. Culver.
Railway electric track circuit systems (2,663—*131,543*)—Sykes Interlocking Signal and R. W. Tarrant.

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TRAFFIC RETURNS.

Tramway and Omnibus Undertakings in the United Kingdom.

NAME OF COMPANY OR CORPORATION.	1918. WEEKS ENDED.					1919. WEEKS ENDED.					AGGREGATE.		
	Aug. 31	Sept. 7	Sept. 14	Sept. 21	Sept. 28	Aug. 30	Sept. 6	Sept. 13	Sept. 20	Sept. 27	Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Aberdare U.D. Council	542	512	508	508	525	573	551	552	567	119	25	12,790	+ 136
Aberdeen Corporation	2,839	2,773	2,591	2,604	2,714	3,463	3,652	3,659	3,415	3,022	16½	58,625	+ 12,846
Ayr Corporation	604	656	573	501	529	941	723	771	1,526	645	19	17,979	+ 3,426
Belfast City Tramways	8,471	8,660	8,799	8,757	8,882	10,178	10,657	10,838	10,638	10,254	26	268,896	+ 62,103
Birkenhead Corporation	2,297	2,336	2,255	2,364	2,352	3,039	3,195	3,189	2,834	2,985	25½	71,881	+ 13,810
Birmingham Corporation	23,172	23,760	24,079	24,579	25,060	25,566	26,050	26,327	25,420	26,817	26	666,241	+ 57,161
Birmingham Motor Buses	1,406	1,452	1,398	1,403	1,454	1,656	1,701	1,871	1,634	1,717	26	45,750	+ 5,885
Blackburn Corporation	1,862	1,673	1,953	1,963	1,827	2,320	2,340	2,696	2,810	2,085	26½	63,081	+ 13,784
Bradford Corporation	9,676	9,919	9,157	9,600	9,706	10,977	11,404	11,897	11,398	11,815	26	298,736	+ 57,873
Burnley Corporation...	2,326	2,361	2,437	2,325	2,426	3,049	3,098	3,641	3,017	3,232	...	...	...
Burton-on-Trent Corporation ...	426	419	420	422	413	545	543	529	529	529	26	13,153	+ 2,330
Bury Corporation	2,060	2,263	1,881	2,190	2,083	2,310	2,506	2,437	2,415	2,571	25½	63,595	+ 8,762
Chatham and District	1,527	1,498	1,450	1,454	1,382	1,768	1,753	1,855	1,703	1,525	38	58,863	+ 8,196
Cork Electric	661	669	680	618	600	878	888	979	876	823	38	26,420	+ 2,093
Derby Corporation	1,538	1,549	1,514	1,505	1,513	2,079	2,165	2,156	2,002	2,021	26	50,881	+ 11,115
Dundee City	2,061	2,066	1,975	1,962	1,984	2,692	2,677	2,690	2,627	2,547	18½	49,239	+ 11,851
East Ham Corporation	1,602	1,679	1,614	1,585	1,725	1,811	1,927	2,018	2,027	2,003	25½	49,992	+ 9,868
Edinburgh Corporation	9,038	9,215	8,535	8,238	8,693	10,708	11,257	10,944	11,229	10,362	12½	151,191	+ 29,998
Glasgow Corporation	28,975	29,971	29,819	29,114	29,254	32,068	33,560	33,348	33,314	33,553	17	547,849	+ 57,790
Glossop (Urban Elec. Supply Co.)...	179	167	166	165	176	229	208	249	228	245	39	8,726	+ 1,629
Huddersfield Corporation	4,077	4,450	3,900	3,873	3,837	4,902	4,880	5,506	4,770	5,124	26	129,036	+ 27,897
Ilford U.D. Council	1,026	1,075	1,025	1,035	1,075	1,254	1,278	1,261	1,214	1,209	25½	31,764	+ 5,369
Ipswich Corporation	935	887	846	911	804	1,069	1,169	1,183	1,027	964	26	25,540	+ 4,334
Isle of Thanet	871	888	756	654	497	2,721	2,361	2,431	2,181	1,572	51½	48,771	+ 32,437
Kilmarnock Corporation	274	271	271	276	274	294	288	288	294	288	19½	5,649	+ 652
Lanarkshire	3,856	3,960	3,956	3,804	3,740	4,150	4,215	4,303	4,268	4,153	38	138,841	+ 738
Leeds City	13,926	14,681	13,889	14,097	14,522	16,028	16,738	17,277	16,508	16,757	26	436,692	+ 91,339
Leicester Corporation	4,642	4,708	4,783	4,724	4,775	6,110	6,084	6,164	5,795	6,046	—	—	—
Leyton U.D. Council	2,405	2,498	2,436	2,478	2,580	2,997	3,104	3,277	3,151	2,991	26	82,409	+ 22,301
Liverpool Corporation	19,051	19,042	18,889	18,889	19,583	23,050	23,951	24,844	24,251	24,647	38½	847,896	+ 149,152
London County Council	70,017	68,545	67,705	67,887	69,081	78,121	79,659	81,974	79,495	78,080	25½	2,050,714	+ 402,186
Maidstone Corporation	306	320	294	329	293	410	434	474	445	433	25½	10,357	+ 2,778
Manchester Corporation	26,829	26,954	26,477	26,698	27,047	29,991	31,263	31,405	30,530	31,145	26	795,031	+ 128,965
Newcastle-on-Tyne Corporation ...	9 273	9,359	9,150	9,231	9,484	9,240	9,709	9,411	9,204	9,486	26	247,925	+ 11,109
New St. Helens and District ...	...	...	...	...	...	...	...	...	...	...	—	—	—
Northampton Corporation	823	791	796	862	898	1,234	1,333	1,141	1,297	1,306	26	33,518	+ 10,861
Nottingham Corporation	5,731	5,647	5,806	5,798	5,723	7,304	7,303	7,476	7,114	7,225	26	185,063	+ 34,198
Oldham Corporation	3,542	3,511	3,304	3,608	3,379	4,041	4,549	4,669	4,487	4,745	27	120,649	+ 25,506
Reading Corporation	1,435	1,432	1,426	1,411	1,415	1,684	1,699	1,779	1,672	1,606	25½	41,908	+ 7,378
Rhondda Tramways	...	...	...	...	...	...	...	...	...	...	—	—	—
Rotherham Corporation	2,584	2,578	2,561	2,674	2,344	2,031	2,164	235	2,126	2,613	26½	55,801	— 5,912
Sheffield Corporation	13,430	13,228	13,044	14,057	13,798	16,675	17,044	7,712	11,250	16,860	26½	439,343	+ 78,214
Southampton Corporation	2.839	2,787	2,752	2,708	2,646	2,901	2,790	2,905	2,790	2,620	25½	71,304	+ 4,324
Southend-on-Sea Corporation ...	2,304	2,370	1,999	1,767	1,463	3,161	3,795	3,344	2,958	2,312	27	64,906	+ 26,555
South Shields Corporation... ...	1,183	1,200	1,168	1,184	1,198	1,524	1,558	1,531	1,490	1,430	26	37,405	+ 6,870
Sunderland Corporation	2,077	2,118	2,033	2,097	2,052	3,012	3,018	3,059	2,835	2,791	26	77 057	+ 21,871
Swindon Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
Torquay Tramways	...	...	...	...	...	...	...	...	...	...	—	—	—
Tyneside Tramways and Tramroads	1,167	1,094	1,093	941	...	1,273	1,201	1,335	1,233	...	12	14,379	+ 919
Wallasey Corporation	2.071	2,040	1,922	1,780	1,799	2,710	2,689	2,803	2,588	2,420	25½	69,482	+ 17,924
Walsall Corporation	1,229	1,215	1,261	1,165	1,284	1,389	1,641	1.640	1,622	1,693	26	37,366	+ 5,160
Walthamstow U.D. Council ...	1,492	1,560	1,416	1,505	1,476	1,685	1,806	1,881	1,750	1,713	26	46,622	+ 7,928
Warrington Corporation	766	792	798	784	809	904	917	920	888	924	25	22,663	+ 3,426
West Ham Corporation	4,705	4,815	4,715	4,719	4,984	5,076	5,287	5,452	5,213	5,150	25½	138,518	+ 21,725
Wolverhampton Corporation ..	1.610	1,644	1,663	1,714	1,686	1,999	2,068	1,983	2,156	2,044	26	53,590	+ 7,807

*** A number of undertakings suspended the issue of traffic returns for the duration of the war.

Colonial and Foreign Tramway Traffic Returns.

NAME OF COMPANY.	1918. WEEKS ENDED.					1919. WEEKS ENDED					AGGREGATE.		
	Aug. 31	Sept. 7	Sept. 14	Sept. 21	Sept. 28	Aug. 30	Sept. 6	Sept. 13	Sept. 20	Sept. 27	Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Anglo-Argentine	56,735	53,819	60,531	53,760	60,741	62,019	60.861	65.111	65,832	61,846	38	2,161,429	+ 48,508
Calcutta ... ... Rs.	78,580	83,044	69,394	73,915	79,634	88,026	90,582	92,623	93,591	91,216	38½	—	+448,517
Madras ... ... Rs.	...	...	...	...	...	...	...	...	...	...	—	—	—
Pernambuco	4,209	4,547	4,294	4,322	4,261	5,047	5.640	5,582	6,196	5,607	38½	199,434	+ 26,864

Companies issuing Monthly Statements only.

	1918.						1919.						Wks.	AGGREGATE.	
	April	May	June	July	Aug.	Sept.	April	May	June	July	Aug.	Sept.		1918-19.	+ or −.
	£	£	£	£	£	£	£	£	£	£	£	£		£	£
Ballarat & Bendigo	4,095	3,286	3,076	2,948	...	...	4,291	3,266	3,261	2,981	...	...	16	13,799	+ 394
Brazilian Trac. Mlrs	8330000	9030000	9087000	9465000	9491000	...	9208000	9562000	9369000	10070000	9734000	...	34	73,767,000	+5,118.000
Brisbane	35,530	...	...	36,360	42,670	35,400	38.775	...	...	41,610	42,245	41,970	39	346.370	+ 20,516
British Columbia	$515,417	486,876	488.873	413,968	544,339	...	631,988	628,947	411,605	642,090	667,170	...	8	1,309,260	+ 350,953
Buenos Ayres L'c'z.	41,643	41,315	38.375	41.145	40,006	...	43,607	47,317	61,356	45 222	45,310	...	13	137,378	+ 13,410
Burma	27,614	29.019	31,158	34,848	41,855	...	36,815	38,900	41,518	44,045	43,683	...	4	43,683	+ 1,828
Cape Town	19,011	...	17,612	18,409	...	...	22,564	23,405	22,432	12,792	...	...	—	—	—
Carthagena & H. ...	4,200	5,027	5,047	5,491	2,729	2,549	1,786	3,226	3,373	4,183	2,991	1,539	39	25,504	− 12,897
Cordoba	...	...	...	...	...	...	...	...	...	...	...	...	48	159,203	+ 11,492
East India	1,791	1,920	1,754	1,968	1,975	1,939	1.920	2,131	2,323	2,687	2,761	2,831	9	5,592	+ 1,678
Kalgoorlie	2,876	2,767	...	...	...	...	2,907	2.796	...	...	...	...	22	13,196	− 42
La Plata	5.169	5.105	5,135	6.721	4,382	4,999	5,630	5.702	5.105	5,317	5,729	5,540	39	51,043	+ 4.722
Lima	43,557	42,949	42,161	45,964	...	...	49,968	42,968	47,811	49,025	...	...	30	331,932	+ 29,748
Manila ...	$163,500	175,500	183,250	...	...	...	212,638	183,050	160,670	...	...	...	26	1,207,412	+ 170,313
Monte Video ...	33,704	32,301	30,503	31,684	16,937	29,611	37,014	37,382	34,650	34,139	34,873	35,552	47	404,501	+ 57,428
Peruvian ...	$ ...	...	...	987,300	...	...	...	...	...	1058730	...	...	—	—	—
Para	24,745	24,925	25,445	24,398	24,672	...	25,342	24,503	24.647	24,659	24,890	...	39	221,626	+ 3,020
Port Elizabeth ...	4,028	...	5,404	3 395	...	...	5,576	5,145	4,868	3.247	...	...	—	—	—
Rangoon	5.885	5,719	6.163	6.054	5,760	6,067	6,217	6,533	6.276	6,562	6,472	6,812	39	58,472	+ 2,892
Toronto ...	$1065766	1090747	1035932	1049936	1070567	...	1051960	1032717	842,697	977,262	1083741	...	35	8.194,299	− 282.373
Winnipeg ...	$ ...	280,935	293,140	288,155	288,974	...	...	248,191	112,615	337,978	353,194	...	35	2,565,812	+ 177,345

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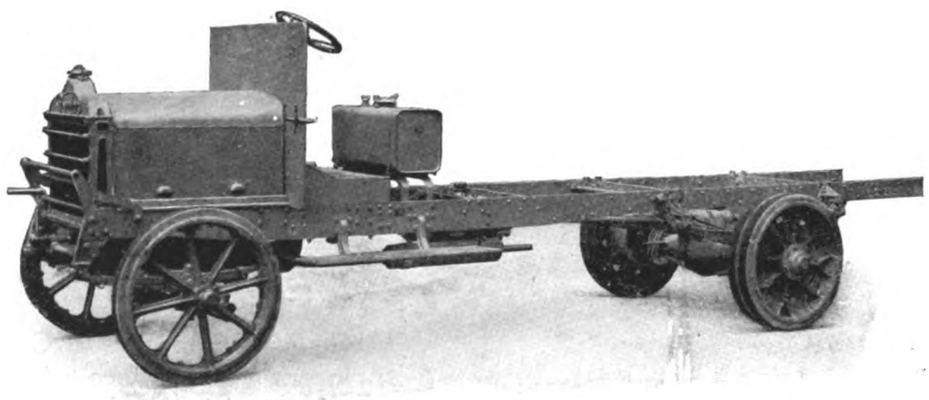

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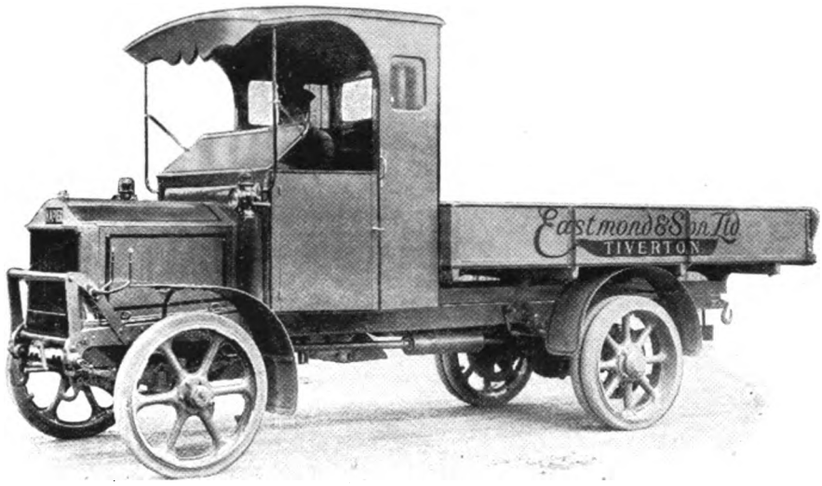

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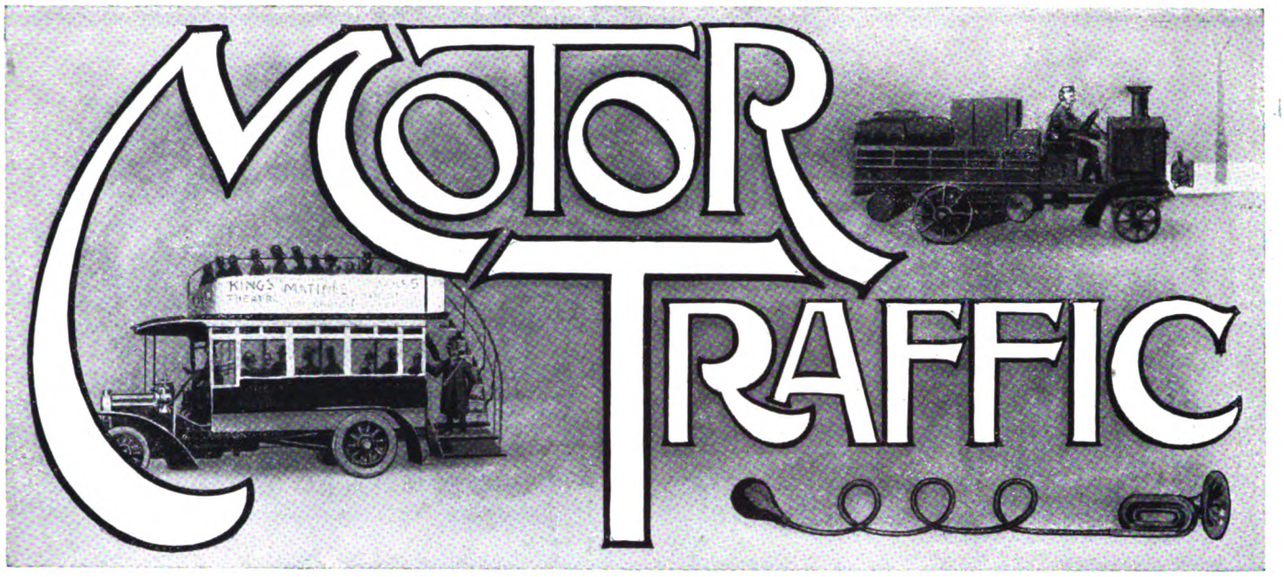

THE ROADS ADVISORY COMMITTEE.

The Ministry of Transport has begun work; the formation of the Roads Advisory Committee may be regarded as imminent. While the general composition of this Committee has been defined, there is no arrangement as to the appointment of members by specific organisations. The main representation should, of course, be by county and local authorities and by the actual users of road vehicles. If the Committee is to be complete, it should be recognised that among the latter are included the manufacturers of those vehicles who are themselves in every case users, and are naturally possessed of a large amount of valuable information as to the proper method of employing them and also as to their design and construction. It would be reasonable if the composition of the Committee also recognised the fact that the industries of the country as a whole are great potential users of road transport, and should be recognised as such in this connection. This would entail the nomination of a representative by some such organisation as the Federation of British Industries.

COMMERCIAL VEHICLES AND THE BOARD OF TRADE.

The deputation of commercial vehicle manufacturers which waited upon the President of the Board of Trade received little comfort. They were told that their industry was already protected against American competition by the equivalent of a 45 per cent. duty. The basis of this assertion rests upon high ocean freights and insurance rates and the bad state of the exchange between this country and America. The last-named was said to have an effect equal to a 15 per cent. duty, while ocean freights with insurance are stated to be equivalent to a 20 per cent. duty and inland freights in America to a further 10 per cent. There is a fairly general impression to the effect that all these figures are on the high side, and that the total in fact would not work out to much, if any, more than 30 per cent. It is, moreover, argued with some reason that the value of this adventitious protection is very doubtful. The state of the exchange tends to put up the cost of living and the cost of raw materials here, and so to increase the cost of British manufactured goods. High ocean freights have an exactly similar effect. Altogether, the factors under consideration, while they certainly tend to discourage American importers, are in an almost equal degree handicapping British manufacturers. Consequently the protection afforded to the latter is more apparent than real. It has been suggested in some quarters that there is no reason why the commercial vehicle industry should be afforded any Government safeguards that are not given to British industries generally. Perhaps the chief answer to this argument is that the generality of industries are not now faced with the competition of large quantities of their own products thrown upon the market in new and second-hand condition by the Government. There is a well-grounded belief that if the Government chose to expedite the disposal of surplus vehicles, any shortage of transport vehicles which now exists could be very promptly remedied, even if imports were strictly limited either by a temporary tariff or by some other means.

THE ROADS AND TRANSPORT CONGRESS.

The gathering at the Roads and Transport Congress in November will be a very representative one. Sir Eric Geddes has become president, and the list of vice-presidents includes Sir Henry Maybury and the presidents or chairmen of practically all the big organisations of motor users and manufacturers. The programme of papers and discussions is a good one, and, as already remarked, gives scope and opportunity for expressions of all points of view. Thus the event should help towards a more complete mutual understanding between road interests and transport interests. The exhibition, which will be opened at the Agricultural Hall while the congress is taking place, is being supported by leading manufacturers of steam and petrol vehicles of types suited for municipal and local services of every kind. The exhibits should, from this standpoint, be extremely interesting as indicating the great variety of public services to the performance of which the modern motor vehicle is admirably adapted. That the local government and engineering organisations have combined in the task of organising the congress is a good augury for a united effort on their part to promote the success of the roads transport division of the Transport Ministry. It is a portent of much value at this period, when industrial unrest is jeopardising the nation's recovery from the strain of war and its capability to take part in supplying the necessities of impoverished lands, that there is an intention on the part of both road and rail transport interests to assist Sir E. Geddes in his great task. The more hearty the nature of that support, the sooner will end the interval of spade work which must be undertaken before practical results can come from the Ways and

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Communications Act. When that era is reached the nation and its industries will be the gainers in more ways than one. Passenger and goods haulage at a reasonable cost are necessary alike to the welfare of the State, its industries and its workers, but the task of securing something like a return of pre-war travelling advantages is one that will tax the cleverest brains.

As a contribution towards that end the Roads and Transport Congress is to be welcomed. The association of two interests in this function is a recognition of the contention which we have often advanced, namely, that the road must be made to suit the vehicle. In these days any other course is a waste of public money, and productive also of injury to vehicles whose existence is of advantage to the community. Motor vehicle manufacturers and road engineers were among the most active of war workers, both in the actual theatres and on the home front, and they should have something worthy of exhibiting as the result of their labours during the past five years. Road engineers can demonstrate that it is uneconomical to defer Treasury recognition of the needs of local authorities, and even more wasteful for the latter to continue makeshift methods of road construction. That being so, no great interval should elapse ere the road transport section of the Ministry starts upon effective work. As for the vehicle makers, they now have a task of scarcely less importance than the work they undertook in the war. Their machines are needed to ensure the success of housing schemes and the reconstruction of industry. In the latter term may be included the widespread demand for municipal service vehicles. This demand arises from a twofold cause. The first is the unmatched efficiency of mechanical traction; the second is the high cost of haulage by horse and of labour. It is ruinous to give the latter any but the most efficient tools.

MOTOR RESEARCH.

The Research Association of the Motor Industry may now be said to have emerged from the chrysalis stage. It starts with the support of a very considerable number of the leading firms, involving, when taken together with the Government's assistance, an income which one imagines will not work out at anything less than £10,000 a year. This income is guaranteed for five years to come, and it is highly probable that the estimate given above will presently be found to have been considerably exceeded. The association will as promptly as possible set about the two branches of its work, one being the actual conduct of research into certain urgent problems connected with motor design and construction, and the other being the collection of scientific information likely to be of value to the industry from all sources through the world. This latter will be a big job, and evidently will not suffice in itself. The information, when collected, will need to be very systematically arranged and put into a form intelligible to those who have not a full knowledge of foreign languages. There are many researches which cannot advantageously be begun until the collection of information is at least fairly complete. It is no use duplicating work already carried out or depending on methods of investigation which may have already been proved to be in some way or other faulty and misleading. We wish the new Research Association a long and prosperous existence, as it constitutes an instrument that, if properly handled, will mean a far better utilisation of the strength of the Motor Industry.

MOTOR SERVICE TO THE NATION.

In November, 1914, long before the nation had any knowledge of the work which motor vehicles were performing in the war, we predicted that their service would win for them what might be termed their Magna Charta. That expectation was fulfilled to the utmost, but although the war has been over for eleven months, there is no sign of the Government's intention to concede those alterations of the Motor Car Act and of the taxation regulations that have long been urgently needed. Indeed, they appear to have adopted an attitude of ingratitude by refusing to grant the industry the fiscal protection necessary to enable it to regain the business which had to be sacrificed when every energy was strained to provide for the needs of the forces. Perhaps the powers that be may be animated by the spirit of justice when they have time to reflect upon the grand work that the motor vehicle, industrial and private, accomplished in the railway strike. An invaluable aid towards that achievement has, it is fair to admit, been rendered by the much-criticised repair depot at Slough, thanks to the energy and ability of Mr. Wallace, of the A.E.C. There is no need to take an exaggerated view of what was accomplished by public and private vehicles, augmented by a daily output of one hundred lorries and fifty cycles from Slough. It is sufficient to claim that motor traction secured the movement of food supplies and the mails during the six days that elapsed before a goods service could be instituted on the railways by the aid of loyal workers and of voluntary effort. In one other direction motor transport rendered great and efficient service. We refer to the haulage of agricultural produce, in the movement of which the farmers had some experience during the last year of the war, when the Road Transport Committees, in conjunction with the Food Committees, introduced the mechanical vehicle to the farmyards and lands. This work has been repeated on the present occasion, when with the advantage of fixed prices for everything, the farmer has been saved the trouble of attending markets, and enabled to concentrate on work required to be done on the land.

Deprived of the motor vehicle, the Government would have had to take armed possession of all the railways, as was done in 1911, and used voluntary labour in the dangerous task of restoring some sort of goods service. While this was being worked up there would have been a shortage of food. Equally slow would have been an attempt to use the coast shipping service, now depleted as the result of the war and the lower transport charges on the railways. In addition there was the added risk that the dock workers would have resented this method of defeating strikers with whom they are in alliance. These considerations should be noted by the motor industry when the time comes for claiming the reforms to which it is entitled. The possession of many thousands of serviceable lorries, augmented by daily arrivals from France by the train ferry, and the output from Slough, enabled the Government to prepare for the strike several weeks in advance. This work was entrusted to Major Bell, of the Food Ministry, operating through the local committees and the Royal Army Service Corps.

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MOTOR TRAFFIC.

Creditable as the work of the motor vehicle has been, it affords no justification for the absurd speculation of newspaper writers who have declared that the railways will be displaced by the road motor. The reason why the latter has captured much of the furniture removal business and the transport of a great part of market garden produce is that the latter traffic, not being too bulky, lends itself to a form of transport that entails only one handling. There is still less likelihood of passenger traffic generally being transferred to the roads. Even if their surfaces were able to withstand the wear, the thoroughfares would be inadequate to accommodate the traffic, while fares would be too high and speed too slow. The contention as to fares is borne out by the charges levied on the hundreds of chars-a-bancs and cars which were put on the roads during the first week of the strike, but many of which went out of service whenever a railway service was re-started. The motor vehicle will undoubtedly come into greater use for short distance work and touring, but the only real rival to the steam engine will be electric traction. Probably the first demonstration of this will be provided by the London-Brighton line, whose directors have long recognised that it is impossible to further augment the services under steam conditions. On the great lines running north, goods and mineral traffic will be the first to be moved by electricity, which has for some years proved its superiority in those services on a section of the North Eastern Railway A consideration not to be lost sight of is the great expense of the strike motor traffic, which will entail increased cost of food distribution. This will doubtless have to be made a charge on the Exchequer, and the same course should be followed in regard to claims for damage to roads entailed by "extraordinary" traffic. The latter legal obstruction to enterprise ought to receive its quietus by this strike.

NATIONAL MOTOR TRANSPORT OPERATION.

GREAT SCHEME THAT SECURED THE FOOD SUPPLY DURING THE RAILWAY STRIKE.

In his speech at the Guildhall on October 7, on the occasion of the presentation of the freedom of the City to Lord Allenby, the Prime Minister disclosed that as far back as February last the Government took steps to initiate a national motor transport scheme with a view to securing the food supply in the event of a railway strike. Mr. Lloyd George also stated that the plan was purposely kept separate from a war organisation that might cease to exist after the declaration of peace.

On neither of these counts is any excess of credit due to the Government. At a time of world upheaval, with labour unrest rife in this country since the armistice, with the railways congested, and with the food supply and prices in such a condition that the Food Ministry had to remain in existence, it would have been criminal to have failed to be prepared for any contingency. Despite the Prime Minister's air of mystery, it has long been known that it was in connection with the lapsed war time transport arrangements of the Ministry of Food that the preparations were made for utilising motor vehicles for the conveyance of food. It was patent that the scheme would be needed only in the event of a strike interfering with deliveries by the railways. With the Defence of the Realm Regulations still in existence it was an easy matter to requisition the vehicles. Now that the crisis has passed, the nation will be glad to learn that the scheme devised by the Committee presided over by the Home Secretary is not going to be scrapped. Revival of it will be easy when occasion arises, and the knowledge of this should exert a peaceful influence on industrial disturbers.

REQUISITIONING OF VEHICLES.

When the national railway strike was declared at midnight on Friday, September 26, the Food Controller put into force the Road Transport (Requisition) Order, 1919, dated August 27, 1919, made under the Defence of the Realm Regulations. Under that Order the Food Controller authorised his local commissioners in the 12 food areas to requisition horses and road vehicles (whether the latter are horse-drawn or mechanically propelled) in use or capable of being used for the transport of goods by road. Immunity was, however, allowed to horses and vehicles employed for naval, military, official, medical or veterinary purposes, to vehicles plying for public hire, and to horses and vehicles used wholly or mainly for agriculture. At the same time the Board of Trade gave notice that in order to ensure the maintenance of essential supplies of food during the railway strike it might be necessary to suspend entirely the transport of coal. The Board of Trade, therefore, wished to impress upon every member of the public that it was his personal duty to cut down consumption of coal, gas, and electricity to the lowest limit, so as to conserve stocks.

Further, the Board of Trade announced that Emergency Orders had been issued:

(1) Requiring gas undertakings to manufacture gas in such a way as will enable them to spread the consumption of their supplies of coal over as long a period as possible while still supplying gas of serviceable quality.

(2) Requiring the discontinuance of all outside advertisement or display lighting on any premises, and also of any inside advertisement or display lighting in shops after closing thereof.

(3) Limiting purchases or deliveries for household consumption to 1 cwt. per week, prohibiting purchases by or deliveries to persons who have more than 10 cwt. in stock, and giving power to local fuel overseers to require registration of all consumers, and to cut off supplies of gas or electricity where there is waste.

Many thousands of vehicles at once became available throughout the country, and during the week nearly a thousand more were forthcoming from the Slough Motor Depot of the Disposal Board and the Ministry of Munitions and from France. Concurrently with the issue of the Requisitioning Order, an Inter-departmental Road Transport Committee was instituted under the chairmanship of Sir Philip Nash, the head of the Traffic Department of the Ministry of Transport, who in 1916 was deputy-director-general of transportation to the British Expeditionary Force, while in 1917 he became director-general of transportation for all the Allied Armies in France. Favoured by fine weather during the whole period of the strike to Sunday October 5, the arrangements appear to have worked with surprising smoothness in each of the 12 areas. The roads were thronged with motor lorries, and running in all directions were thousands of cars and chars-a-bancs carrying passengers returning from the seaside and elsewhere. Many cars arrived in London from Scotland. Portsmouth Corporation Tramways department ran one of their new omnibuses daily to Hyde Park Corner and back, starting at 8 a.m. and returning at 4 p.m. for a return fare of 25s. A useful service between London, Reading, and Aldershot was provided by the London General Omnibus Company and the British Automobile Traction Company. The former ran a service to Aldershot, via Sunningdale, and the latter inaugurated a service linking Reading with Sunningdale.

THE DISTRIBUTION OF FOOD SUPPLIES.

The organisation of the transport service was not the only achievement of the Ministry of Food. Before the strike they had accumulated stocks of foodstuffs at convenient centres. For the Metropolitan area and the six Home Counties of Kent, Surrey, Sussex, Essex, Herts., and Middlesex, huge clearing houses had been established, six on the north side of the Thames and six on the south side. With the aid of the wholesalers, a scheme was devised under which the entire food distributing businesses pooled their resources and handed them over to the Ministry of Food. Under this plan a commodity—for example, margarine—instead of being packed at the factories and taken to the warehouses, was distributed direct from the depots to the areas, thus avoiding waste of transport and labour.

Owing to the delay in the postal service the Food Ministry instituted a mail service for their own requirements, thus saving in the Home Counties a good six hours. A large contingent of members of the Automobile Association and their cars were utilised, this Association also assisting in petrol distribution. The A.A. further asked their provincial members to get in touch with the nearest postmaster in order to assist in collecting and conveying mailbags. Members of the Royal Automobile Club were prominent in offering their services in various capacities. The A.A. placed their telephones and patrols on all the main roads at the disposal of the transport columns, and their motor car and motor cycle section of the Metropolitan Special Constabulary, under Mr. C. Temperley and Colonel Jarrott, patrolled the roads and took precautions against disorder.

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MOTOR TRAFFIC

THE NEW LONDON GENERAL OMNIBUS.

On this page are reproductions of photographs of the new omnibus of the London General Omnibus Company taken to show at a glance the main features that contribute to the increased carrying capacity of the vehicle. Seating for 46 passengers (22 inside and 24 outside) is provided, as against 34 in the old type. In Fig. 1 the extension of the body over the wheels is shown. This feature may prove to have another advantage by giving the effect of an additional lifeguard, which will be brought into play in some instances before the guard between the front and rear wheels. Divided by a brass upright as in tramway car construction, the platform is considerably wider than on the old type of omnibus, thus facilitating the departure and exit of passengers.

Details of the chassis and body were given in our issues of July 17 and August 14, together with plans and several photographs. The new vehicle is being produced in increasing numbers at the works of the A.E.C. at Walthamstow, and although it is at present to be seen only on a few routes, it is highly popular. The public appreciate it for the increased comfort given by its mechanical advantages, its seats (Fig. 2) facing—with four exceptions—the direction in which the omnibus is travelling, its wider gangway, and the ease of entering and leaving. So far the machine has given satisfaction from an operating point of view.

Figs. 3, 4, and 5 show the chassis elevation from three aspects. These views well convey an impression of the strength and lightness of the chassis, Figs. 3 and 5 also serving to indicate the manner in which provision has been made for a longer body by bringing the driver forward over the engine.

Chassis Details of K.1 Type.

Appended is a detailed description of the K.1 type :—

The engine has a bore of 100 m/m and stroke 140 m/m. The cylinders are in pairs, with valves on one side. There is a three-point camshaft and chain drive with magneto. A spindle provides for chain adjustment. The water circulation is by pump driven by separate chain from magneto shaft. The crankcase, of the extended type, has the bottom face joint well below the crankshaft centre. Lubrication is by pump and trough system, the oil pump being driven by a skew gear from the crankshaft. The aluminium split skirt pistons are provided with the gudgeon pin clamped in the connecting rod and running direct in the pistons. The radiator is similar to the standard type, with aluminium top and bottom tanks with side brackets. Four rows of $\frac{3}{8}$-in. gilled tubes and one row of plain copper tubes in the front maintain a neat appearance.

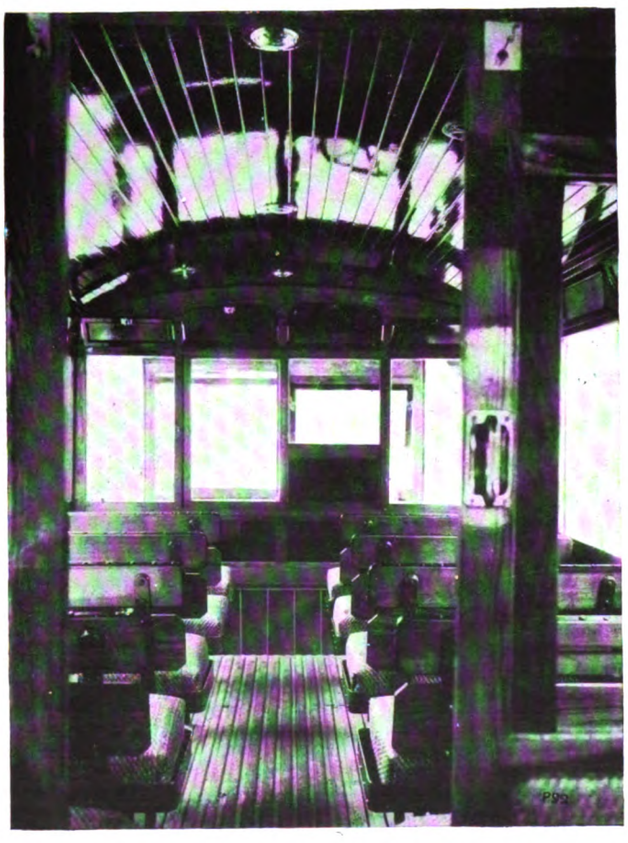

Fig. 2.—The Increased Comfort of the Interior.

Fig. 1.—Showing Extension of Body Over the Rear Wheels.

In its general construction the clutch may be described as a multiple plate ferodo clutch, to run dry. It has a central spring and direct acting withdraw gear. The ferodo discs are rivetted to the outer steel plates, and as an alternative design, floating ferodo discs are fitted.

Coming to the rear axle, brakes, and road wheels, there is underslung worm drive with bevel type differential carried direct in the axle casing. The gear ratio is 8·25 to 1. The main axle is formed by pressing tubes into the centre axle casing without extended castings as at present used. The springs are carried on floating spring carriers, which carry the back anchors and transport the torque direct to the springs, the driving torque being taken by a spring blade torque rod bolted up solid with the axle case, and held at the front end in a spherical bearing with the ball cups insulated on rubber pads.

The road wheels run on Timken bearings carried in a hub with a tapered exterior, which fits into the road wheels, the latter being driven by dogs on the hub and pulled up into position by left and right hand screwed studs. Internal expanding brakes act on both the rear wheels, one being inside the other, with two different brake drums arranged concentrically. the hand lever operating on the small drum.

The road wheels, which are made from steel castings, are of equal diameter all over the chassis. The rear wheels are each fitted with two solid rubber tires, 100 m/m wide on 771 m/m rims. On the front wheels there are single tires of the same size.

The front axle is an " H " section stamping in 3 per cent. nickel steel. The swivels are jawed, and the swivel pin is fixed in the axle on a taper. The steering gear is similar to the standard " B " type in construction, with two threads on the worm and nut instead of three. The main coupling operates across the chassis, and is attached to a boss in the centre of the cross arm on the near side. Both coupling rods are situated behind the front axle. The clutch and brake pedals are carried on the steering box, and form one unit.

The frame is of the Flitch type, extended on the rear to carry the passenger platform. The driver's seat is arranged alongside the engine with an aluminium dashboard fixed behind and rather to one side of the radiator. The petrol tank is fixed in a narrow case across the chassis behind the engine and driver's seat, and comes between the omnibus body and the engine.

The road springs are wider and longer than the existing " B " type. The compound volute spring over the back axle is arranged

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MOTOR TRAFFIC

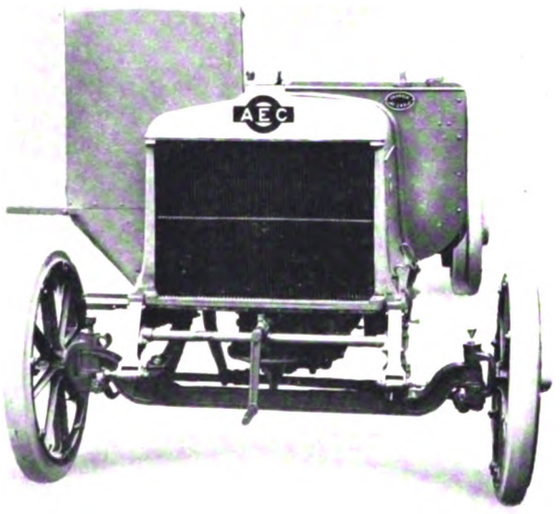

Fig. 3.—A Front View of the Chassis.

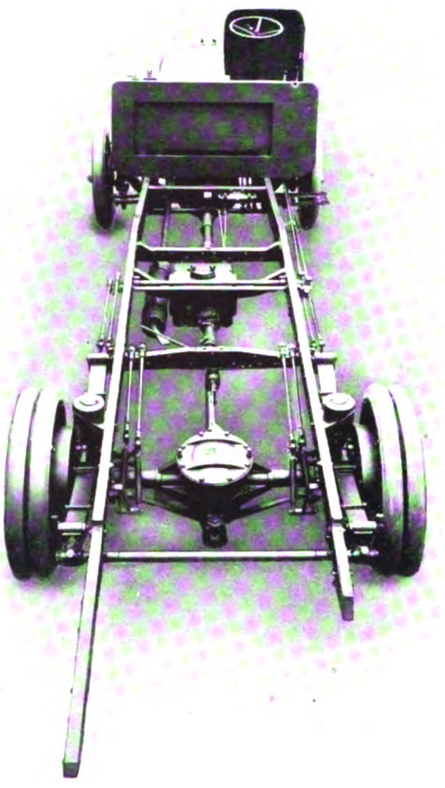

Fig. 3.—Plan View of the Chassis.

so that the empty omnibus weight comes almost wholly on the main springs, and the larger volute springs, when compressed to the normal, fully loaded position, will carry 9 cwt. of the load weight.

The cardan shafts are made on nickel chrome steel with spliced ends, the back and front shafts being allowed to slide one end, the front shaft on the rear end and the near shaft on the front end. The pins run on roller ball bearings of a much heavier design than the " B " type. The end thrust on the jaws is taken up on hardened steel discs carried on the joint cage. The weight of the frame is 4 cwts. 3 qrs. 1 lb.

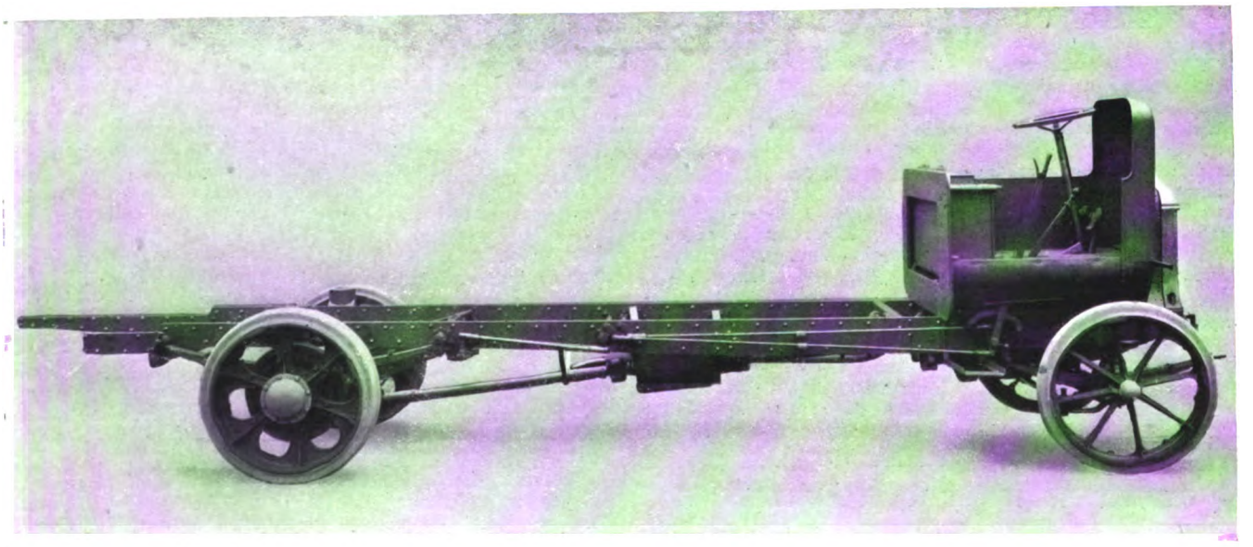

Fig. 4.—Side Elevation of Chassis.

Views of the K1 Type of Omnibus being introduced by the London General Omnibus Company.

These Cars are Built by the Associated Equipment Company, Limited.

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MOTOR TRAFFIC

LORRIES FOR RAILWAY RELIEF.

Railway companies are taking full advantage of the Government offer to give them the use of motor lorries on hire for the purpose of relieving the congestion in the goods yards and docks due to the shortage of rolling stock. The companies provide the drivers, and for that purpose are engaging men who have served in the mechanical transport branch of the R.A.S.C.

Sir Henry Thornton, general manager of the Great Eastern Railway, is thoroughly appreciative of the efficacy of this means of relieving congestion and of dealing with traffic which the company has hitherto been unable to accept. Interviewed on the subject he said: "I hope as far as I can to use the lorries for the distribution of goods within an area of 10, 15, or 20 miles. This would help things very much. Of course, this method will not be so economical as the ordinary one, but then these are exceptional times, and exceptional means must be taken to deal with the situation. We have a vast quantity of fertilisers on our hands, and we are naturally anxious to get them on to the farms, where they are much wanted. It is a matter of national importance that the stocks of food should be given out as rapidly as possible. Further, we want to get the raw material which is lying idle into the manufactories, so that the latter can resume full work and absorb as many of the unemployed as possible. Our company have at present about 40 lorries engaged in this work. I have asked for 100 more, and I am going to get as many in addition as I can. I can utilise as many motor lorries as I can get hold of, provided I can only secure the drivers."

As to Sir Henry Thornton's statement that motor traction will not be so economical as the ordinary method, the following table puts the matter in a different light when the number of handlings and haulages by rail and by road is considered:—

Per Rail.	Per Road.
From warehouse or shop by road to London terminus.	Warehouse, by motor vehicle and road to customer direct.
London terminus by rail to wayside station.	
Wayside station by road to local tradesman.	
Local tradesman by road to customer.	
Eight handlings, four haulages.	Two handlings (in and out of van), one haulage.

It appears that at present the supply of lorries rendered available by the army is not adequate to the demands of the railway companies. In the Port of London especially the number in use up to the end of September was stated by an official to be very small.

The Port and Transport Executive Committee were still without a reply to their scheme that the Government should place at their disposal several hundred lorries, which the committee would be free to allot, wherever and whenever needed, to docks, harbours, or railway companies.

MUNICIPAL MOTOR WORKING COSTS.

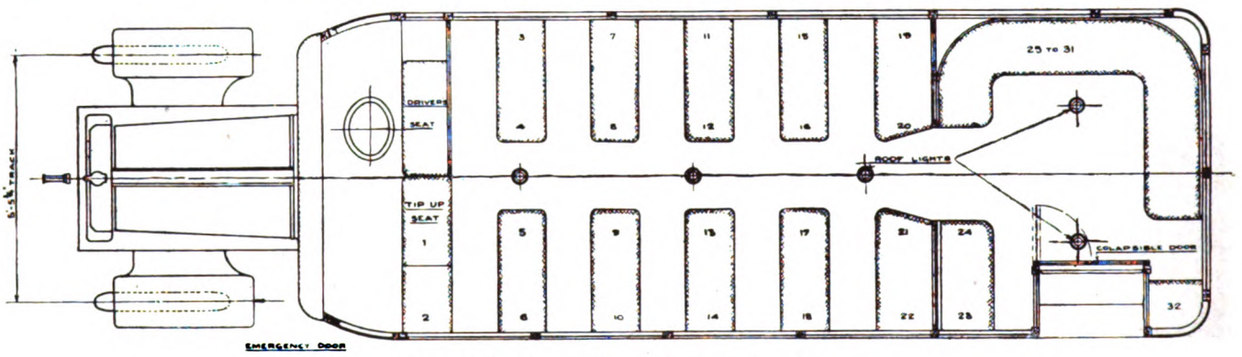
In the annual report of Mr. W. Greig, the superintendent of the cleansing department of Glasgow Corporation, it is stated that the cost per ton of the electrical vehicles engaged in the collection and removal of house refuse was 4s. 2¾d., against 5s. for horse vehicles. The report adds that the electric vehicles "have given very satisfactory results, having been found efficient, reliable, economical, and easily driven." It is proposed to order ten more electric wagons. Owing to difficulties created by the war the petrol vehicles were on several occasions out of commission for want of material for repairs. Consequently the working costs were high, and Mr. Grieg looks for better results in normal times. The working costs of petrol-driven street sweepers was 7d. per 1,000 square yards swept, and of horse-drawn sweepers 8d. for a similar area. Of the twenty mechanical vehicles in use, ten are petrol sweepers, six are 2-ton Edison electric wagons, and two are 3-ton petrol wagons, one a traction engine for farm work, and one an agricultural tractor.

SINGLE-DECK LEYLANDS.

Plan and Particulars of the Interior.

In our issue of September 11 there appeared a photograph of the handsome single-deck omnibuses which have achieved great popularity at Birkenhead, where they are operated by the Corporation tramways department. It is becoming increasingly apparent that machines of the double-deck type are only for a very limited field.

Since the armistice public vehicle authorities—both municipal and of private enterprise—finally convinced of the advantages offered by the self-contained motor vehicle, have not been slow to make up their minds at last as to the desirability of developing their employment for passenger transport services, and generally speaking their choice is now falling on the single-deck type.



Plan of the Leyland Single-Deck Omnibus.

A large proportion of the orders for this class of machine is falling to the share of Leyland Motors (1914), Limited, and we append particulars of some of the latest deliveries of this class of vehicle from the Leyland shops.

The single-deck machine to-day is a very different vehicle from what it was even so short a time as five or six years ago, and the type—of which the new vehicles for Birkenhead Corporation are excellent examples—leaves very little to be desired in respect of this class of transport. The new Birkenhead fleet consists of the 33-seat single-deck machine, with accommodation for three passengers in front with the driver, commodious cross-seat interior for ordinary passengers, and a cosy small compartment at the rear for smokers. Entrance is obtained through this rear compartment by steps from the near side. The clerestory roof has, as a general rule, been abandoned for this class of machine as being an unwarranted complication and one involving unnecessary expense.

The Birkenhead omnibus, which is quoted as a typical machine, is mounted on what is known as the Leyland Company's "O" type chassis. It, however, has a 40-48 H.P. engine fitted, while a similar fleet for Edinburgh is fitted with a standard 36-40 H.P. engine.

Yet another fleet of single-deck omnibuses is on order for Eastbourne. In this case the body work generally corresponds to that for other owners, but the driver's compartment in the front is entirely enclosed.

Amongst the owners for whom fleets of these interesting and highly finished vehicles are on order at the present time with the Leyland Company may be mentioned Birkenhead, Edinburgh, Eastbourne, Maidstone, Mid-Kent, Worthing, Tunbridge Wells, Wellingborough, Cambridge, and Barnsley. No fewer than 53 vehicles of this class are on order for the British Automobile Traction Company, Limited. Model "O," which is the type employed as a rule for this class of vehicle, is the standard Leyland worm-driven type.

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MOTOR TRAFFIC

"KARRIER" TIPPING LORRY.

DESCRIPTION OF A NOTABLE MACHINE.

The accompanying photograph shows a "Karrier" tipping lorry fitted with twin telescopic screw hand-operated tipping gear and a capacious body. The tipping gear works with remarkable smoothness, and requires neither effort nor strain to operate it. The body —steel lined, strongly constructed, reinforced with metal—is designed for hard work. The engine develops 50 H.P. at one thousand revolutions per minute. The cooling system is ample and efficient and over-heating has never been known to occur. There are four forward speeds, and one reverse. From 15 to 16 miles per hour can be done on the first speed, 8½ on the second, 5¾ on the third, and 2¾ on the fourth respectively and approximately. The gears are of heat-treated nickel chrome steel, hardened in oil, with teeth of a specially strong stub form, and will withstand excessively hard wear. Large diameter ball bearings are fitted.

The back axle is fully floating, and relieves the transmission of all strain, and by reducing the unsprung weight lessens wear of the tires. The drive is by coupling shaft between the gear-box and propeller shaft. The propeller shaft is carried in the torque tube, and drives the bevel pinion on the live axle. The combined radius and torque tube has a large spherical joint at the forward end, and is anchored to the main frame; the rear end is bolted to a flange on the live axle housing.

The bed of the live axle is a solid high tensile steel forging, which carries the whole of the imposed load. The axle is free to adapt itself to the motion of the springs; the torque is transmitted direct to the frame. Large diameter ball journal and thrust bearings are fitted throughout. Shafts and gearing are of a special heat-treated nickel chrome steel. The axle shafts are subjected to driving stresses only. The whole of the final gearing and differential can be removed by lifting off the housing, and the spur wheel and the differential

The "Karrier" Tipping Lorry.

can be dropped by removing the sump; either operation can be completed without removing the road wheels or jacking up.

The overall length with the short frame is 20 ft. 10 in.; with long frame about 22 ft. 8 in.; the overall width (back axle) is 7 ft. 2 in. This lorry carries a maximum gross load of 4½ tons. In the design great care has been taken to reduce friction, so that all working parts are smooth running. This lengthens the life of the machine, and by reducing friction petrol and oil consumption is economised.

PORTSMOUTH MUNICIPAL TOURING CAR.—Portsmouth Tramways Committee recently purchased a touring car. This is well patronised by visitors, and is seldom run without its full complement of passengers.

MOTOR OMNIBUSES AT OLDHAM.—The general manager and engineer of Oldham Corporation Tramways gives the following particulars of the working of the two motor omnibuses during the year ended March 25, 1919:—Gross capital expenditure, £3,380; traffic revenue, £713; total revenue, £716; working expenses, £1,627; income-tax, £4 10s.; deficiency, £914 16s.; miles run, 15,375; passengers carried, 120,319; percentage of working expenses to receipts, 226·91; average revenue per mile, 11·187d.; average expenses per mile, 25·397d.; average fare paid per passenger, 1·409d.

EDINBURGH CORPORATION CHARS-A-BANCS.

Considering that the country around Edinburgh is well supplied with motor omnibus services, which afford facilities for pleasure trips, it required considerable courage on the part of the management of the Corporation Tramways to decide to institute chars-a-bancs services for tourists in the city and vicinity. The enterprise shown

An Edinburgh Corporation Leyland Chars-a-Banc.

by Mr. R. S. Pilcher gives promise of proving a profitable venture, for the Corporation, as will be gathered from the above illustration of a fully-loaded 30-seat vehicle running on the southern tourist route at the low charge of a shilling. The comfortable travelling that can now be afforded by these cars running on solid tires affords ample justification for the extension of this form of enterprise to other municipal tramway undertakings. It is, of course, free from the inconvenience that is liable to overtake such vehicles when fitted with pneumatic tires. Further, it enables a much more extensive area to be traversed than is the case with the toast-rack rail cars utilised by a number of tramway authorities. This has been recognised by a number of tramway companies, notably the Lancashire United Company, which has a large fleet of these vehicles.

ROADS AND TRANSPORT CONGRESS.

REPRESENTATIVE LIST OF VEHICLE EXHIBITORS.

The Minister of Transport (Sir E. Geddes) has accepted the presidency of the Roads and Transport Congress and Exhibition, which is to take place from November 20 to 27, at the Agricultural Hall, London, under the auspices of the County Councils Association, with the co-operation of the associations representative of municipal, urban, and rural councils, engineers and surveyors.

The list of papers to be read was given in the issue of this journal for September 11. Delegates will attend from local authorities and from institutions interested in road and transport matters. On Saturday, November 22, and Monday, November 24, a conference will be held under the auspices of the London Safety First Council.

Among the firms who will exhibit are the Albion Motor Car Company, Anglo-American Oil Company, Anglo-Mexican Petroleum Company, Associated Equipment Company, Aveling and Porter, W. and T. Avery, Barford and Perkins, British Reinforced Concrete Engineering Company, H. G. Burford and Company, Caledon Motors, Car and General Insurance Corporation, Clayton and Company (Huddersfield), Clayton and Shuttleworth, Daimler Company, Dennis Brothers, Dunlop Rubber Company, R. A. Dyson and Company, Eagle Engineering Company, Eagle, Star, and British Dominions Insurance Company, Edison Accumulators, Fodens, J. Fowler and Company (Leeds), R. Garnett and Sons, General Vehicle Company, Guy Motors, J. and E. Hall, Lacre Motor Car Company, Leyland Motors (1914), Macintosh and Company, Maudslay Motor Company, North British Rubber Company, Ransomes, Sims, and Jefferies, Robey and Company, Shell Marketing Company, Shrewsbury and Challiner Tyre Company, Straker-Squire, Tasker and Sons, John I. Thornycroft and Company, Tilling-Stevens, Townmead Construction Company, Walker Brothers (Wigan), Wallis and Steevens, Gordon Watney and Company; and Yorkshire Commercial Motor Company.

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MOTOR TRAFFIC

MOTOR TRADE'S REQUEST FOR IMPORT DUTIES.

THE GOVERNMENT'S DISAPPOINTING DECISION.

At the Board of Trade, on September 22, Sir A. Geddes, President of the Board of Trade, received a deputation from the Association of British Motor and Allied Manufacturers, together with representatives of British makers of agricultural tractors.

Mr. H. C. B. UNDERWOOD, president of the association, said that while it was agreed that British manufacturers had large numbers of orders on their books, attention must be called to the fact that large importations in the near future would lead to the cancellation of many of these orders, and particularly those which had been placed by agents whose contracts under existing conditions could not be enforced. The representations of the industry were therefore made largely for the purpose of retaining orders already upon the manufacturers' books. Were any considerable proportion of these orders to be cancelled British manufacturers would be obliged to reduce their programme of output and to dispense with the services of a considerable proportion of their employees. The American industry was leaving no stone unturned to consolidate its export trade and crush our competition. It must also be remembered that the British industry had to face the competition of manufacturers importing, or likely to import, from Italy, Germany, and elsewhere. They had excellent reasons for saying that at the present time the number of vehicles still to be disposed of by the Government would not be less than 35,000. It was estimated that the annual output of the American industry immediately before the war did not exceed 20,000 commercial vehicles, and the latest information indicated that the output of the American industry during the present year would not be less than 250,000 vehicles.

For the Agricultural Tractor Manufacturers, Mr. G. WOOD (Saunderson Company, Limited) stated that certain British firms which had completed their plans for entering this new industry were now standing aloof, pending some Government action calculated to render their enterprise somewhat less speculative. At the moment no encouragement was offered. While a duty of 33⅓ per cent. was for the present imposed on imported motor cars and motor cycles, commercial motor vehicles and farm tractors might be brought into the country free of duty and in unrestricted numbers.

REPLY OF THE PRESIDENT OF THE BOARD OF TRADE.

Sir A. GEDDES, in the course of his reply, said that the position was such that automatically the industry had a very much higher degree of protection than was ever dreamt of before the war. They knew that in the case of the ordinary pleasure car or private car they had a 33⅓ per cent. duty upon it. In actual figures, by the time that car came to be put on the market here, as a result of freight charges, packing charges, insurances, and loss of exchange, the actual rate of protection which existed on the private car was over 88 per cent. There was at the present time an effective protection in the case of commercial vehicles equivalent to a 45 per cent. *ad valorem* duty. It was because they realised such a protection existed against America—and would exist for some time to come—in preparing the proposals for the control and helping British trade during the period of readjustment, they felt it unnecessary, in fact contrary to the interests of the nation as a whole, to add a higher protection than that which would automatically exist in the case of commercial vehicles. Very high prices were now being paid for old army vehicles. There was an enormous demand for commercial vehicles in this country which could not be met, and the meeting of which they knew, from a thousand-and-one representations which had been made to them, was absolutely necessary if they were going to get the traffic of the country controlled evenly and smoothly. At the present moment the country was, so far as road transport was concerned, passing through a period of transition. There was much less road transport, horse transport, than before the war. There was a much larger motor transport from various sources, but one of the great difficulties with which they were faced was the getting of the railway services running evenly and smoothly. One of the greatest difficulties in securing that desirable state of things was the absence of the machinery which made it possible to lift at the terminus and distribute the goods which were delivered there.

URGENCY OF THE TRANSPORT PROBLEM.

At the present time he knew of nothing more urgent than to get the internal transport unlocked. We were selling as rapidly as we could every vehicle of a suitable type which was in the Government's possession. Prices were still very high, but the prices were keeping up because of the transport difficulty. There was an enormous demand within our own boundaries for commercial vehicles of the lighter type. In the country there was a great desire to absorb commercial vehicles of every kind. They looked round and saw the possible sources of supply and what the dangers were that affected them. They saw the development of the industry during the war, which had been strengthened considerably in that period. They saw a conceivable source of supply across the Atlantic, and a source of supply which, in order to get into this market, would contribute or add to the cost of its vehicles something in the neighbourhood of 45 per cent. *ad valorem* duty as a result of freight rate, insurance charges, and the loss on exchange. Germany might be able to supply, France might be able to supply, and Italy might supply a certain amount, but they were far from having an exchange like the American exchange. Even if it were desirable to give protection to their industry, which he left open in face of the circumstances which existed, a tariff would be of no use, because it would be worked on the American side and not on the European side at all. A tariff was not the way to deal with their particular requirements or the requirements of any industry like theirs. It would be perfectly useless at the present time. He was anxious to meet them that day to see if in connection with commercial cars they had overlooked any facts, but he did not think the deputation had added any fresh knowledge to that already in possession of the Government. The Government could not agree to impose an additional 33⅓ per cent. on American lorries. It was unthinkable. The Government was fully alive to the fact that it was not possible to say "Here is a policy which stands for all time with regard to treatment of imports." It was not possible to say that at the present moment. The whole world was in a state of economic turmoil, almost economic chaos.

THE DEPUTATIONS' DISAPPOINTMENT.

Mr. UNDERDOWN said the Minister's reply would be a very great disappointment. They had received with astonishment the statement that the present rate of protection was 88 per cent. They made it 66 per cent. or 67 per cent. The Government had evidently based their decision on the very high prices now being obtained for Government vehicles. Those high prices were not only temporary, but very temporary.

Sir A. GEDDES.—We hope so.

Mr. UNDERDOWN said there were indications that prices were dropping. They knew also that there were 35,000 Government vehicles still to come on the market. These vehicles were nearly all of one freight capacity, but manufacturers went in for different weight-carrying vehicles.

Mr. ARTHUR SPURRIER (Leyland Motors) said that on the question of prices during the last auction the average price of commercial vehicles sold dropped to 270 guineas. He maintained that if the Government were not so abominably slow and bound by red tape they could put 15,000 vehicles on the market at the present time, and reduce the price to 100 guineas apiece.

Sir AUCKLAND GEDDES.—It would not be the type of vehicle which is most urgently required at the present time.

Mr. SPURRIER said that the type most required was a 4-ton lorry. The Government could put 15,000 four-ton lorries on the market at the present time, and if they chose to they could relieve the whole of the transport difficulties.

TRANSPORT MINISTRY AND THE ROADS.

Under the Ways and Communications Act a Roads Committee has to be formed to give advice and assistance to the Minister of Transport. There are to be not less than eleven members, five representing the highway authorities, five to be users of horse and mechanical road traffic, and one representative of labour. Sir Henry Maybury, the director of the roads department, has invited the County Councils Association, the Association of Municipal Corporations, the Urban and Rural Councils Association, the Royal A.C., the Automobile Association, and the Commercial Motor Users' Association to nominate representatives. Representations have been made to the Ministry in favour of representation of the manufacturing and trading sides of the motor industry.

NEW ENGINE FOR CARS AND VANS.

The Dorman Company, of Stafford, recently gave an exhibition of a new 4-cylinder Dorman engine for light cars or vans. Rated at 10 H.P., the cylinder dimensions are 69 by 100 m.m., giving 1,496 c.c. On the test bench the engine gave 15 H.P. at 1,500 revolutions per minute, and 20 H.P. at 2,000, and the power curve obtained was practically straight up to the highest number of revolutions yet attained. It is hoped to reach an output of a thousand per month of these engines, and the price, variable according to size of contract, is £47.

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MOTOR TRAFFIC

LONDON OMNIBUS TRAFFIC.

THE QUESTION OF SUITABLE ROUTES.

Reporting to St. Pancras Borough Council, the General Purposes Committee say that the London General Omnibus Company have informed them that they propose to restore the omnibus facilities formerly provided *via* Queen's Crescent, Haverstock Hill, Crowndale Road, Pancras Road, and King's Cross Road, from which the omnibuses were temporarily withdrawn owing to war-time conditions. The question of omnibus routes is governed by Section 20 of the Local Government (Emergency Provisions) Act, 1916, which provides that "it shall not be lawful after the passing of this Act for any omnibus to ply for hire on, or use, any route which has not been regularly used by omnibuses plying for hire within two years prior to the first day of March, 1916, except with the consent of the highway authority or, if more than one, every highway authority liable for the maintenance and repair of the highways along which the route runs, which consent may be given on such conditions as the highway authority may consider fit, or, if, in the opinion of the Local Government Board, such consent is unreasonably refused, or if such conditions are unreasonable, without the consent of the Local Government Board," etc.

In reply to enquiry the company state that Queen's Crescent, Haverstock Hill, and Pancras Road were occupied by omnibuses from November 13, 1913, to August 5, 1914, and King's Cross Road from February 23, 1914, to August 5, 1914: further, that the routes in question were traversed daily and the omnibuses ran at alternate intervals of six and seven minutes; and consequently the thoroughfares in question have been regularly used by omnibuses within two years prior to the March 1, 1916, referred to in the statute. They also state that although, as a matter of courtesy, advice of the proposal has been forwarded, the consent of the Council in the circumstances is not necessary to the restoration of the service, although they will be happy to learn that the Council do not raise objection.

The committee are of opinion that the Council should resist any attempt to run a service of omnibuses along Queen's Crescent, as that thoroughfare from Prince of Wales Road to Malden Road is entirely residential and paved with macadam, which has been recently re-formed, and will not carry such traffic.

The Council, in 1913, and the early part of 1914, requested that the service then running along Southampton Road, Queen's Crescent, and Prince of Wales Road should be altered, owing to damage to property in Queen's Crescent and to the destruction of the road. It was suggested that the company should arrange for the service to proceed down Malden Road and Prince of Wales Road, instead of by Queen's Crescent. The last communication on this point was sent to the company on January 16, 1914. Soon after this date the service was discontinued, and therefore the matter dropped.

The borough engineer is of opinion that the service terminated much earlier in 1914 than the dates mentioned by the company.

During the years 1914, 1915, and 1916, the line of thoroughfare from Chalk Farm Road through Ferdinand Street, Malden Crescent, Malden Road, and Southampton Road, where the sides of the roads had previously been macadam, was paved with granite setts at a cost of £10,000, with the stated object of rendering it suitable for omnibus traffic.

ROAD TRAFFIC IN WORCESTERSHIRE.

In his report on road maintenance in Worcestershire during the year ended March 31 last, Mr. C. F. Gettings, the county surveyor, gives the following table to illustrate the development of traffic on the Birmingham-Halesowen road during the past five years:—

	Motor Omnibus. Tons.	All Motor Traffic. Tons.	All Traffic. Tons.	
January, 1913	24	1,754	4,669	
July, 1913	2,586	5,135	7,784	
January, 1914	3,450	5,619	9,086	Total
July, 1914	3,822	7,016	10,539	traffic
August, 1915	4,062	8,043	11,054	for
July, 1916	4,680	10,082	12,324	7 days.
August, 1917	3,678	12,259	14,869	
July, 1918	3,636	10,073	13,350	
July, 1919	8,034	15,289	17,588	

Tar painting was carried out on 139 miles of road, thus preserving many of the roads during the winter, as it would have been impossible to treat anything like such an area with surfacing work. Many of the roads failed under the extraordinary timber and munition traffic, and Mr. Gettings urges that expenditure incurred in this respect should be repaid from the National Exchequer on a ton-mile basis under which it would be an easy matter to arrive at the amount due.

MOTOR VEHICLES FOR MUNICIPALITIES.

RUGBY COUNCIL are ordering two lorries.

BURY CORPORATION are purchasing a lorry.

REIGATE COUNCIL are obtaining three wagons.

BOGNOR URBAN COUNCIL have ordered two lorries.

MIDDLETON COUNCIL have placed an order for a lorry.

MALVERN URBAN COUNCIL have bought a lorry at a cost of £750.

BRISTOL CORPORATION are buying four Government steam wagons.

ILKLEY URBAN COUNCIL have ordered an electric tipping wagon.

LLANDUDNO URBAN COUNCIL contemplate purchasing a steam lorry.

BEDFORD CORPORATION have placed an order for a motor fire engine.

DEWSBURY CORPORATION propose to obtain a tipping wagon and sweeper.

LLANELLY CORPORATION contemplate purchasing three electric vehicles.

BECKENHAM COUNCIL have received sanction to purchasing a lorry by loan.

CONSETT URBAN COUNCIL have decided to obtain a lorry for cartage of refuse.

TYNEMOUTH COUNCIL have asked for a loan in order to purchase four motor wagons.

BURNLEY CORPORATION'S application for a loan for a fire engine has been sanctioned.

SOUTHPORT CORPORATION have received sanction to borrow the cost of a tipping wagon.

HARWICH CORPORATION are ordering two electric vehicles, and also establishing a garage.

MEXBOROUGH COUNCIL are seeking approval to a loan for the purchase of a tipping wagon.

MARGATE COUNCIL are authorised to borrow £3,150 for the purchase of three Foden wagons.

RUTHIN RURAL COUNCIL are borrowing £1,662 for the purchase of a steam tractor and trailer.

GLASGOW ELECTRICITY COMMITTEE have invited tenders for the provision of six electric vehicles.

BRADFORD WATER COMMITTEE have purchased a lorry, also a passenger car for their engineer.

FAREHAM URBAN COUNCIL have called for a report on the subject of purchasing a motor fire engine.

WILLESDEN URBAN COUNCIL propose to raise a loan of £18,489 for purchasing fourteen electric vehicles.

WALSALL COUNCIL have directed the surveyor to secure lorries and plant for carrying out road repairing.

DORKING RURAL COUNCIL have received sanction to raising a loan for purchase of a steam tractor and trailer.

LIVERPOOL WATCH COMMITTEE have placed a contract with Leyland Motors, Limited, for a fire engine.

EDINBURGH TRAMWAYS COMMITTEE propose to obtain six more chars-a-bancs for tours in the city and district.

OLDHAM CORPORATION are permitted to raise a loan for the purchase of steam wagons for the collection of refuse.

SWANSEA ELECTRICITY COMMITTEE have ordered an electric wagon from Messrs. Ransome, Sims and Jefferies, Limited.

OTTERY ST. MARY COUNCIL have decided to obtain a steam lorry, the surveyor having reported that it would effect great economy.

WEST HAM COUNCIL'S proposal to purchase a motor fire engine and three motor combinations by means of a loan has been sanctioned.

ST. AUSTELL URBAN COUNCIL have accepted the tender of Messrs. Dennis Brothers, of Guildford, for supplying a 45-H.P. turbine fire pump.

CHORLEY COUNCIL have received sanction to borrow the money needed to purchase a fire engine; they also propose to secure four motor wagons.

RICHMOND CORPORATION have received sanction to a loan for the provision of electric vans for the collection of refuse in the Thames side town and two motor fire engines.

ABERDEEN CORPORATION have ordered five more Leyland wagons for refuse cartage from city depots to the tips, the present vehicles showing a great saving on the cost of horse haulage.

ROTHERHAM TRAMWAYS COMMITTEE have recommended that four omnibus bodies be obtained from Messrs. J. Bartle and Company, London, at £500 each, and two chassis from the Associated Equipment Company, Limited, Walthamstow, at £900.

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MOTOR TRAFFIC

MOTOR TRAFFIC NOTES.

A New Omnibus Service.—A service of omnibuses is now running between Hendon and Farnborough, a distance of 26 miles, at a fare of 1s. 5d.

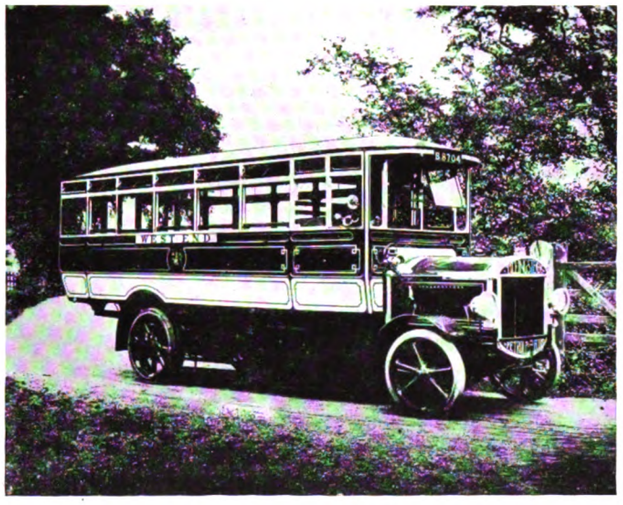
Road Classification.—Grantham Council have arranged to take a traffic census upon the various roads in view of the classification which will be made by the Ministry under the new Transport Act.

Motor Cycles for Police Inspectors.—The Commissioner of the Metropolitan Police has decided to provide motor cycles for the sub-divisional inspectors in the outlying districts in lieu of horses.

Road Foreman's Motor Cycle.—Walthamstow Urban Council are purchasing a new high-power motor cycle for the road foreman in place of the 2¾-h.p. machine which has been in constant use for five years.

A First Experiment with Motor Vehicles.—Public authorities are now fully alive to the great economies effected by the motor vehicle. The well-known Clyde Trust of Glasgow have decided to make their first experiment in motor vehicles with an Albion 3-ton lorry.

Mileage Recorders Essential.—Hammersmith Borough Council have two motor tractors on order, and have decided to purchase mileage recorders at a cost of £12 each, because the surveyor declared these to be essential in order to keep a complete record of the mileage and work of the vehicles.



Popular Tilling-Stevens Cars for Inter-Urban Service.

Albion Company's Memento of the War.—As a memento of the important part played by Albion motor wagons in the war the Albion Motor Car Company, Limited, Glasgow, have presented 40-in. models of their 3-ton war wagon to the South Kensington Museum and the Australian Imperial Forces.

Omnibus Drivers to Slow Down.—Willesden Urban Council report that as the result of representations the London General Omnibus Company have issued instructions to drivers to negotiate the corner of Sidmouth Road and Willesden Lane at a low rate of speed, and that six miles per hour has been fixed for Sidmouth Road.

The Road Transport Board.—Since the Road Transport Board completed the work of registration of motor vehicles assigned to it by the War Cabinet, it has been reduced to a nucleus. It is now co-operating with the Ministry of Transport in the placing of army lorries at the service of the railway companies.

Twopence per Omnibus Mile.—On condition of the payment of 2d. per omnibus mile, Oxfordshire County Council has sanctioned the institution of four new omnibus routes. Lancashire County Council, in consenting to several omnibus services, has stipulated that the vehicles shall run along routes defined on a plan to be supplied by the county surveyor, and that 2d. per vehicle mile shall be paid to the Council, together with an initial fee of one guinea per annum; that a journey book be kept by the applicants in which the journeys made each day are to be recorded, with the number of passengers, such book to be open to the inspection of the county surveyor or his agent.

Road Damage by Old Motors.—Heston and Isleworth Urban Council have lodged a complaint with the Government as to damage caused to roads by the passage of "improperly constituted and dilapidated vehicles believed to be the property of the War Department." It is believed that the old motors are en route through Hounslow for Slough. Some vehicles have wheels without tires or rims, and others are heavily laden lorries with flats on wheels, causing vibration sufficient to damage the electric and gas mains.

Road Foundations to Last One Hundred Years.—The Borough Engineer of Marylebone estimates that the foundations now being laid for the repaving of Oxford Street will last a hundred years. The existing foundations were made fifty years ago, and the wood blocks put down in 1904. Oxford Street carries some of the heaviest traffic, and the Borough Council are spending £30,000 on repaving, which will take three months to complete. By utilising a crushing machine for the treatment of the good material in the old foundations great economies are being effected.

Congestion at Stopping Places.—Hammersmith Borough Council have been in communication with the London General Omnibus Company and the London United Tramway Company with a view to their making arrangements whereby the stopping places of their vehicles at the junction of Goldhawk Road and King Street could be separated by a short distance so as to minimise the inconvenience to passengers alighting from the cars, and to the traffic generally at this point. The suggestion put forward by the Council has been agreed to by the companies, and the scheme is now in operation.

Revival of Chars-a-bancs Tours.—With the termination of the war the highways are alive with tourists and day trip parties in motor chars-a-bancs. T. Cook and Son have taken up the business, and from London this summer they have been running coaches (holding 20 passengers) to Devon, Cornwall (Land's End), Somerset, Oxford and Thames Valley, Kent, the South Coast, "Shakespeare's Country," and from Bournemouth into the West Country. In several districts in the Metropolis this class of vehicle is now to be found catering for long and short tours, the South Coast towns being a popular day trip.

Increased Wages of Belfast Motor Drivers.—At a conference held between representatives of the employers and the officials of the Irish Transport Vehicle Workers' Federation, it was agreed that all classes of motor drivers be paid a minimum wage of £3 per week. It was further agreed that men at present in receipt of higher pay should not have their wages reduced, but should receive the weekly advance of 4s. on war wages as settled some time ago. It is understood that the new scale applies to all drivers of commercial motors in Belfast, and that in some cases it will represent an increase of from 10s. to 15s. a week.

Remarkable Aero Engine.—During the war the Sheffield firm presided over by Mr. W. H. Allen was asked by the Government to undertake the manufacture of the French aero engine "La Rhone." Over 3,000 engines were produced. On September 25 Mr. Allen presented one of the engines to Sheffield University, and said that he believed the day would come when an engine would be constructed which would produce one horse-power per pound. Dr. Ripper, in accepting the gift as the head of the University Engineering Department, said it would be a standing example of metallurgists' splendid work. The engine was of startling design, and at 1,300 revolutions per minute developed 100 h.p., though it could stand on a small drawing table. The next step, no doubt, would be the invention of a gas turbine, running at a higher revolutionary speed, with greatly reduced weight per horse-power.

SOME GOVERNMENT VEHICLE PRICES.

At an auction sale of Government motor vehicles at Earl's Court, on September 24, the following prices were realised, the machines being driven into the grounds by their own power:—A F.I.A.T. landaulette, 730 gs.; Maudslay lorries, 500 to 600 gs.; Sunbeam touring car, 375 gs.; Wolseley landaulette, 520 gs.; limousine of the same make, 330 gs.; Lancia touring car, 300 gs.; Studebaker cars, from 150 to 245 gs.; Ford's, 120 gs.; British Berna lorries ranged from 125 to 180 gs.; a Pierce Arro lorry, almost new, 340 gs.; Hallford lorries, 120 to 260 gs.; Kelly lorries, from 70 to 75 gs. (low figures, due to the fact that the lorries had "been under the sea"); Renault touring, 160 gs.; Packard lorries, 75 gs.; and water-tank trailers, with pneumatic tires, from 10 to 14 gs. A Peerless workshop lorry, fully equipped, started at 500 gs., and within a couple of minutes found a purchaser at 1,200 gs.

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THE
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SATURDAY, OCTOBER 18, 1919.

AN IMPASSE IN THE TRAMWAY INDUSTRY.

Tramway authorities all over the country received news of the award of another increase in wages with something like a feeling of dismay. Not even the most successful undertakings can afford such an addition to their expenditure, and there are many, both municipal and company, on whom the burden falls with crushing force. Before the award was issued the financial situation of the industry as a whole had become exceedingly difficult. Several municipal undertakings are already on the rates, some company tramways are carried on at a loss. East Ham reports a loss of £11,000 on last year's working, and even Glasgow, hitherto the envied of prosperous municipal enterprises, has shown a loss of over £10,000 on three months' operations. Manchester Corporation is to pay £30,000 more in wages; Salford has to add £11,000 to its expenditure, and with every undertaking the cost of operation goes up proportionately. A strange notion prevails in labour circles that tramway enterprise contains within it infinite possibilities of wealth, but the idea is founded on a total unacquaintance with the basis facts of the industry. Traffic is the sole source of tramway revenue, and that shows signs of having attained its maximum intensity and must rather diminish than increase when the nation resumes normal conditions. If increased revenue is no resource, then economy in expenditure is the next remedy. But the only possible way of reducing expenditure is to reduce wages, and that is out of the question. Tramway authorities have no control over the prices of track materials, electrical equipment or rolling stock, and prices for all these things continue to rise. No tramway undertaking is perfectly organised, and small savings in operation and administration may be possible here and there, but to look to such a source for appreciable help is so palpably absurd as to be beneath discussion. Fares and fares alone are the only possible source of increased revenue; and it is by increased fares that the greater expenditure rendered necessary by the demands of the tramway workers must be met. This places the whole matter in the hands of the public. If they are prepared to retain highly paid employees to operate the vehicles they ride in, they are perfectly entitled to do so. But the just increase in fares is in many cases prevented from coming into operation by the statutory limit imposed on fare charges. The act passed in August, 1918, purports to give a certain amount of relief, but in reality it does little more than admit the right of tramway undertakings to existence. Practically, it requires that an undertaking should arrive at the brink of insolvency before it is allowed to raise fares 50 per cent. at the most; and in only two or three cases has it been of any advantage. Absurdly inadequate from the first, such a provision has become mere mockery in the present position. The statutory limit of fare charges was framed to meet difficulties long obsolete, and to obviate dangers long vanished. Tramway authorities know very well that there is a limit beyond which fares cannot be raised without actually decreasing revenue, and they may be trusted consequently to exercise due moderation. If the tramway industry is to be saved from absolute ruin, some means of averting coming catastrophe must be found at once. The Tramway Associations should, without delay, formulate a Bill, providing for the immediate abrogation of the statutory limit on fares, and take the most urgent steps to secure the assent of the Government and their promise to press it through Parliament with the least possible delay.

GLASGOW TRAMWAY MEN'S WAGES

The five points in dispute between those Glasgow Corporation Tramway employees who were not a party to the recent National Arbitration and the Corporation were discussed in the City Chambers, Glasgow, on October 13, before the arbiter, Sheriff John Wilson K.C. An arrangement was proposed and the proceedings were adjourned *sine die* in order that it might be considered by the Corporation on the one hand and the employees, represented by the Municipal Employees' Association, on the other.

It was stated that the proposed arrangement would dispose not only of the five points put forward by the Association, but would settle the claim made for a minimum wage of £4 per week for these employees. The application by the Municipal Employees' Association presented to the Corporation in June last asked that the tramway men be paid 54 hours wages for a 48 hours working week; that their working day of eight hours be finished within a period of ten hours, and that any time worked in excess of ten hours be paid for at the rate of time and a half; that in respect of the four general holidays namely, the Spring Holiday, Fair Monday, the Trades Holiday or Victoria Day, and the Autumn Holiday—time and a half rate be paid; that for New Year's Day double time be paid; and that time and a half be paid for all Sunday labour.

"SAFETY FIRST" FOR SCHOOL CHILDREN.

GREAT MEETING OF EDUCATIONISTS.

During one year 261 young persons were killed and 6,296 injured in street accidents in the Metropolitan Police area alone. This large sacrifice of young life is largely avoidable, and from time to time the suggestion was made in the press and by London Coroners that children should be systematically instructed in the avoidance of danger in the streets.

For the past three years, the much-needed education of school-children in the dangers of the streets has been carried on in a practical and efficient manner by the London "Safety First" Council in co-operation with Education Authorities and teachers. Striking posters, illustrated pamphlets and books of nursery rhymes have been widely distributed. Lantern lectures and cinema exhibitions have been given. Annual essay competitions have been conducted, in which 50,000 pupils participated. "Safety First" squads in schools are being formed, and specially organised "Accident Prevention" games providing healthy recreation and invaluable instruction will shortly be introduced.

To stimulate even greater interest, especially in educational circles, the London "Safety First" Council is holding a special meeting of educationists at the Central Hall, Westminster, on Friday, the 24th instant, at 7.30 p.m. Short addresses will be delivered by Sir W. Joynson-Hicks, Bart., M.P., Chairman of the Council, Sir Edward Smith, J.P., L.C.C., and Mr. Thomas Gautrey, J.P., L.C.C. The proceedings will be interspersed with vocal and instrumental music and the exhibition of "Safety First" films.

Admission by invitation card can be obtained from the Hon. Secretaries of the Council at 31, Westminster Broadway, S.W.1

York Tramcar Shed. The Tramways Committee have recommended that application be made for a loan of £3,200 for a site for the erection of a new car shed.

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L.C.C. TRAMWAY MATTERS

Passenger Boat Service on the Thames.

At Tuesday's meeting the following reports were considered :—

In accordance with the resolution passed by the Council on May 13, 1919, the Highways Committee submitted a long report dealing with the suggestion for starting a new service of passenger boats on the Thames. The Committee recalled that the Council unsuccessfully sought to obtain Parliamentary powers for the establishment of a service of boats in the sessions of 1901 and 1903, but was successful in 1904. An expenditure of capital not exceeding £280,000 was authorised by the Act. The total expenditure incurred, however, amounted to £301,080. During three years the passengers carried totalled 9,783,114, and the actual result for the three years was a loss on working expenses of £79,159. Including debt charges there was a total deficiency of £162,499, and the total contributions from the rates up to March 31, 1909, amounted to £169,273. In view of the position the Highways Committee on February 18, 1908, recommended that the service should be abandoned and the boats sold. This was done on March 1, 1910. Subsequently the launch and moorings were disposed of, but the piers remained in the possession of the Council and have entailed further expenditure. The Highways Committee reported that the total cost to the ratepayers of the undertakings up to March 31 was £463,832. After carefully reviewing the prospects for the re-establishment of the steamboat services, the Committee concluded that it has been admitted beyond all question that there is no reasonable prospect of such public support being forthcoming as would justify the Council in incurring the serious financial responsibility that would be involved. The reasons which contributed to the failure of the past remain.

Electrification of Tramways.

The Highways Committee reported that they had again had under consideration the question of the electrification of the tramways in Burdett Road and Grove Road. The great obstacle has been the refusal of the Stepney Metropolitan Borough Council to consent to the use of the overhead system. This consent is required by the London County Council Tramways (Electrical Power) Act, 1900. Repeated efforts have been made to obtain the consent of the Stepney Council but without success, although the use of the overhead system on these lines has been agreed to by the Poplar, Bethnal Green and Hackney Borough Councils. It now appears that there is a substantial majority of the Stepney Council in favour of granting consent, but as a two-thirds majority is required the position is at present unchanged. The Highways Committee are considering what action should now be taken.

The Repair of Cars.

The Highways Committee previously reported on the serious shortage of cars, and efforts have been made to overcome the shortage. Between February 1 and June 30 last the car shortage on time-table requirements had been reduced from 295 cars to 36 cars. In October the shortage had been further reduced to 6 cars. The present time-tables have been based more or less on the number of cars available, but even under normal conditions a large number of additional cars are required at the rush hours to meet the needs of the public. The Highways Committee state that every endeavour will continue to be made to secure an adequate supply of stores and fittings to enable as many cars as possible to be continued in service.

New Tramway Proposals.

The Highways Committee stated that they proposed as soon as possible to lay before the Council the particulars of a scheme for new tramways, for which it was suggested that Parliamentary powers should be sought in the session of 1920. A list of such schemes has now been submitted to the Finance and Improvements Committee. It is expected that the full report would come before the Council on October 28, and the Highways Committee now ask that the Standing Order should be suspended so that the matter could be dealt with without standing over for one week.

Appointment of Director of Housing.

Mr. J. P. Orr, C.S.I., C.B.E., I.C.S., has been appointed Director of Housing by the London County Council at a salary of £2,000 a year for a term of two years. In reply to an advertisement 156 applications were received. The list was eventually reduced to nine candidates, who attended before the General Purposes Committee, which finally appointed Mr. Orr.

Sir Edward Smith, J.P., asked why the report of the Select Committee on Transport (Metropolitan area), which dealt with important services of the Council, had not yet been submitted.

Mr. J. W. Gilbert, Chairman of the General Purposes Committee, replied that the report in question had already been before his committee, and had been referred to the Highways, Housing, Local Government and Finance Committees for observations. As soon as those committees had dealt with the report it would be considered further by his committee.

A long debate took place in regard to the report of the Highways Committee recommending "That the Council is not prepared to take steps at the present time with a view to the establishment of any further service of passenger steamboats on the River Thames."

Rev. Dr. Scott Lidgett moved an addition calling for additional inquiry to ascertain if in the remote future it would be possible to give a limited service during the summer months.

This was accepted by Mr. Squires, and as amended the recommendation was agreed to.

The adjourned report on the question of an auxiliary motor omnibus service was postponed for a week.

UNDERGROUND CHANGES.

A number of changes in the organisation of the Operating Department of the Underground Railways and London General Omnibus Co., Ltd., are announced by the management of those Companies :

Mr. J. P. Thomas has been appointed Assistant Operating Manager of the railways and buses.

Captain A. Rozier has been appointed General Superintendent of the London General Omnibus Co., Ltd.

Mr. J. Thornton becomes Superintendent of the Line to the District and Tube Railways, in place of Mr. W. E. Blake, deceased.

For the past 14 years Mr. Thornton, the new Superintendent, has been Chief Inspector of the District Railway. He started life when a youth in the Goods Department of the Caledonian Railway, under Superintendent Harvey, at Lothian Road, Edinburgh. Later, he undertook service in various grades with the North British Railway, Glasgow District Subways, Central London and Great Northern and City Railways, before he eventually joined the staff of the Underground.

MISCELLANEOUS NEWS AND NOTES.

Electrification of Meath Tramways.—Meath Town Council propose to borrow £100,000 for the electrification of the tramways.

Ilford's New Cars.—The 16 new cars which the Ilford Council have ordered will cost £2,016 each. Before the war similar cars could be obtained for £700.

The I.M.E.A. Annual Convention.—The next annual convention of the Incorporated Municipal Electrical Association will be held in Bradford during the week commencing June 20, 1920.

Extension of Time for Tramway Construction.—The Board of Trade has granted a year's extension of time to Balfour, Beatty and Company, Ltd., for the completion of a tramway between the terminus at Stone and the Gravesend system.

Thornaby Demands More Cars.—Thornaby Council has directed that representation should be made to the Imperial Tramways Company as to the overcrowding on the cars, and the need for additional rolling stock.

Railless Cars at Eston.—At a meeting of Eston Council, Mr. W. G. Grace, a member of the joint board controlling the railless cars, said that it was hoped the service would be in operation within two or three weeks. They were waiting for the official inspection of the cars.

Singular Fatality in Dublin.—At the inquest on the 4-year old daughter of Sergeant Cooke, of the Dublin Metropolitan Police, who was killed by a tramcar, it was shown that the child fell in front of the car so that her feet passed below the fender, and that the driver was helpless to save her.

Nottingham Tramway Extension.—Nottingham Tramways Committee have asked the Council to authorise them to take steps to promote a bill in the next session of Parliament to obtain powers to construct a tramway from Beeston to Nottingham and beyond the boundary at Beeston to Chilwell. An extension of the Bulwell section is also proposed.

Sunderland Tramway Extension.—Sunderland Town Council have determined to relieve the congestion of tramway traffic in the principal streets by an additional short line which varies certain routes. The cost is estimated at £5,000, and application is to be made to the Board of Trade for a provisional order to authorise the work.

Proposed Extension at Halifax.—Halifax Tramways Committee propose to obtain powers to extend their lines from Hebden Bridge to the boundary of the district at Whiteley Arches. This would shorten the missing link in the continuity of the tramways from the centre of Yorkshire into Lancashire. Another scheme which may be included in the bill is a new line to Elland.

Leith Corporation and Tramway Wages.—In view of the recent award of increased wages to tramway men, the Committee of the Leith Council have decided to make application to the Ministry of Transport for permission to alter the fares in the event of it being found necessary. The additional wages charge will be about £2,000 a year, and unless fares are increased it is expected that the whole of this extra charge will fall upon the rates.

Lancaster Defers Tramway Purchase.—A joint committee of the Lancaster and Morecambe Town Council had agreed to recommend the purchase of the Lancaster District Tramway Company's undertaking, and, as reported in our last issue, the Morecambe Town Council had agreed to the terms. At a meeting on Monday, October 6, however, Lancaster Town Council demurred, and referred the whole question back to the committee for further report.

The Conductor's Mistake.—At Rushall Petty Sessions a man was summoned for remaining on a crowded tramcar after having been requested by the conductor to leave. It was shown, however, that the conductor had accepted the man's fare, and omitted to state the fact to his superiors when making the complaint. The presiding magistrate in dismissing the case, said to the accused : "You must realise that you are free of this case only because the conductor made the mistake of taking your fare."

Women Conductors on the L.C.C. Tramways.—In reply to a question at the meeting of the London County Council on Tuesday, Mr. W. J. Squires said that since the 31st of July 269 women conductors had resigned, 445 were discharged, and 459 had given notice, making a total of 1,173. The Highways Committee wished publicly to express appreciation of the services of the women conductors, who had enabled the tramway service to be maintained while so many men were on war service, and had done as well as they possibly could.

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Standardised Tramway Wages Next.—Mr. W. Habgood, local secretary of the Nottingham branch of the Tramwaymen's Union, interviewed by a representative of the *Nottingham Guardian*, said: "There was a strenuous fight against giving any increase at all at the Arbitration Court, and taking it altogether the award has been fairly well received. The men will abide loyally by it for the time being. The next move will be for the standardisation of rates, the same as the railway men."

Accident at Burton-on-Trent.—On behalf of the Ministry of Transport an official inquiry was opened on October 14, by Mr. G. L. Hall, into the Burton tramcar accident. The scene of the accident and the damaged car were inspected, and Mr. Hall took evidence in private, at the Town Hall, of the driver of the car, the driver of the preceding car passing up the hill, a lady passenger, and a cyclist who witnessed the accident. The conductress, who heroically stuck to her post, was seriously injured, and one of the passengers has since died.

"Underground" Delegation to United States.—One of the results of the recent visit of Sir Albert Stanley to the United States has been the departure of a delegation representing the underground group to visit the principal cities in the United States. The party consists of Mr. Frank Pick, commercial manager, Mr. C. J. Spencer, general manager of the London United and Associated Tramways, Mr. G. J. Shave, engineer of the London General Omnibus Company, and Mr. A. R. McCallum, assistant mechanical engineer of the Underground Railway. The party sailed by the *Royal George*.

Increase in Wolverhampton Fares.—Owing to increased wages Wolverhampton Corporation Tramways Committee finds itself faced with a sure prospect of loss, unless fares are raised. The whole of the telephone and pilot cables have to be renewed, at an estimated cost of £16,000, and a sum of £13,257 is to be taken from the renewals fund to pay for six new cars. The committee have therefore recommended a general increase on the fares of ½d., and that the minimum ordinary fare be 1½d. They also advise that proportionate increases be made on workmen's and children's fares.

Rolling Stock Shortage at Bradford.—In reply to a criticism of the tramway system at a meeting of the City Council, Alderman E. Priestley, chairman of the Tramways Committee, said that it had been an utter impossibility to carry all the people who wanted to ride. The cars were packed to their utmost limit, but they were prepared to buy more cars if anybody had any good cars to sell. The committee would do all they could, because it was to their interest to get more cars and to have the public use the cars. He had been in the Council about 20 years, and such discussions as they were having had always come up before elections all those years, and they would do so until the end of the tether.

Lancashire Company's Services.—In answer to the objections raised by Lancaster Town Council to the terms under which the undertaking of the Lancaster and District Tramways Companyis to be taken over by the corporations of Morecambe and Lancaster jointly, Mr. Thomas Booth, secretary of the company, has addressed a letter to the local press in which he shows that the negotiations for purchase were initiated by the municipalities and that the advantage in the bargain remains with them, and concludes with the following just reminder: The company consider that they have fought hard under adverse circumstances, and although the concern has not been successful financially, yet for nearly 30 years it has been a public benefit.

Purchase of Potteries Tramways Opposed.—At a largely-attended meeting held at Stoke recently a protest was made against the proposed purchase of the Potteries Electric Traction Company's tramways by the Stoke-on-Trent Corporation. Alderman Goddard pointed out that if the Corporation took over the system they would have to spend at least £300,000 on cars alone, and an enormous amount on putting the tracks in order. They would have to pay for thirty-one miles of tramways £737,000, plus probably a further 50 per cent. of that sum. After a long discussion it was resolved, with only a few dissentients, that the present time was inopportune for the purchase of the tramways, and that the financial proposals respecting the purchase would inevitably entail a considerable increase in fares and a levy upon the rates.

Charing Cross Underground Station.—A new subway is being constructed with the object of avoiding the congestion which now takes place in the circulating areas at the top of the escalators and on the eastbound platform at the foot of the exit stairs (West End). The new subway will be reached by stairs leading thereto from the two "District" platforms, and will be used for passengers going from the District platforms or the street to the tubes; the existing stairs, which now carry traffic in both directions, will be retained for outgoing passengers only. A new exit from the District westbound platform is also proposed. This will be formed by a new stairway from the platform, almost exactly similar to that on the eastbound side. A new footbridge immediately to the west of the station buildings and at street level will be provided, with an exit on the Embankment.

Difficult Year at Liverpool.—At the final meeting of the Tramways and Electricity Committee for the current municipal year, the chairman (Alderman E. Russell Taylor) described the year as one of the most famous in the history of municipal tramways. The calls of labour and the ever-increasing cost of material and overhead charges had been such that they would not find themselves in such a satisfactory position as last year. While the revenue was increasing the expenses had far exceeded any previous years. Fares had been increased, but in his opinion the situation was not fully appreciated by critics. He thought the Committee were to be congratulated upon having piloted their undertaking successfully through such strenuous times. A vote of thanks was accorded to the chairman for his services during the year, and also to the deputy chairman, Alderman Fred Smith, to whom the chairman alluded as one of the pioneers of the undertaking.

Explanation of Tramway Stoppages.—The menace of a tramway strike all over the country had made people very "jumpy," and whenever a stoppage occurred on any tramway system, the notion that it was the beginning of a strike at once took possession of the public mind. A Liverpool tramway official, in an interview with a press representative, has given a diagnosis of the case which might very well be quoted widely. Answering the suggestion that it is a suspicious coincidence that so many stoppages should occur at this time, the tramway man said:—"It is a very remarkable coincidence, and yet when you go into the matter not so very surprising. It has to be borne in mind that the same system is being worked as before the war, and that replacements have not up to now been possible; that owing to the strike the cars had to carry enormous loads, which have put a big strain on the system, and that the break has always come when that strain was at its highest tension. And that is all there is in it."

Great Tramway Development.—A contemporary remarks that the tramway industry is the only part of the electrical world in which there is no "forward movement." The fact is, however, that at no time within the last ten years have so many projects for tramway extension and improvement been under consideration. Many of these plans are already well advanced and only await legislative sanction. It is true that almost all of the schemes are being promoted by municipalities, but they will provide an enormous amount of work for tramway contractors, and will lead to large orders for rolling stock and electrical equipment. The schemes, unlike those for motor traction, are not heralded from the housetops or emblazoned on the front pages of daily newspapers, but they are undertakings of the utmost importance to thousands of citizens, and must eventually be carried out. In particular, there are important developments in the construction of tramways on their own right of way, the tracks being laid either at the side of the roadway or on private land.

Reconstruction at Bournemouth.—As briefly mentioned in last week's issue, Bournemouth Town Council have adopted proposals, involving an estimated outlay of about £244,000, for relaying the tramway track and the purchase of new cars, submitted by the Tramways Committee. It is estimated that the reconstruction of twelve miles of single track would cost £144,000, and in addition 2,000 tons of rails at £20 per ton would be required, making a total outlay on track of £184,000, and, besides, £60,000 would be required for new cars. The general manager, Mr. I. Bulfin, reported that balance of reserves, renewals and other unappropriated surpluses to March 31, 1920, would provide £100,000, leaving the balance to be raised by loan. The Committee recommended that tenders be invited for the work and that application should be made for sanction to raise the loan required. After a long discussion during which some members advocated the scrapping of the tramways and the purchase of motor omnibuses, the recommendation of the Committee was approved.

BUSINESS NOTES.

HANDLEY-PAGE, LTD., have been appointed sole agents by the Triplex Safety Glass Company, Ltd., for the sale of Triplex safety glass in India, Australia, New Zealand and South Africa. All inquiries with regard to business in these countries should now be sent to Messrs. Handley-Page, Ltd., New Works, Claremont Road, Cricklewood, London, N.W.2.

THE GENERAL ELECTRIC COMPANY of New York advise us that for the purpose of conducting their foreign business they have organised the International General Electric Company, Inc., with offices at 83, Cannon Street, London, E.C.4.

MR. W. T. ROBSON sailed by the "Mauretania" for New York on Saturday and expects to devote the next two months to studying American traction methods in various cities in the United States and Canada. Mr. Robson will be pleased to undertake any commission or inquiry on his tour, and he may be addressed in the meantime, care of the TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

MR. J. WILKINSON, tramway electrical engineer of Hull, has resigned his position and commenced business on his own account, under the name of Joseph Wilkinson and Company, consulting electrical engineers, and is dealing with light railway and tramway work and electrical vehicles.

HADFIELDS, LTD., of Sheffield, have an up-to-date plant for the production of tie-bars, and are in a splendid position to execute orders for these.

THE EMPIRE ROLLER BEARINGS CO., LTD., having placed their services at the disposal of the Ministry of Munitions and suspended their ordinary business during the war, have now resumed active operations at No. 13, Victoria Street, Westminster, and will in future be closely associated with Messrs. Ransomes & Rapier of Ipswich and London, of which Sir Wilfred Stokes, K.B.E., is chairman. Mr. Thomas W. How, M.I.Mech.E., who has conducted the Empire Roller Bearings Company's business as managing director since it was established in 1901, will continue in that position and will be assisted by former members of his staff now demobilised.

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PERSONAL.

Sir George Touche, a director of the Anglo-Argentine Tramways Company, has been elected chairman to fill the vacancy caused by the death of Mr J. B. Concanon.

Professor J. A. Fleming will deliver a public lecture, entitled "Speaking Across the Atlantic by Wireless Telephony," on Wednesday, October 22, at 5 p.m. at the University College, Gower Street, London, W.C.

Alderman J. Bowes, who has been chairman of the Manchester Tramways Committee for many years, has been nominated by the City Council to fill the vacancy on the directorate of the Manchester Ship Canal caused by the death of Alderman Sir David McCabe.

Mr. F. H. Edwards, of Hayle, has been appointed electrical engineer of Dartford Council at a salary of £500 a year. If required to do so, he will undertake the duties of engineer and manager of the light railways at the termination of the present arrangement of the Council with Bexley Urban District Council.

Retirement of Colonel Walker.—The *Eastern Morning News* learns with regret that Colonel Walker, chairman of the Hull Corporation Tramways Committee, is about to relinquish his position on the City Council owing to pressure of business, and he will consequently cease to have any connection with the Tramway Committee.

Mr. H. P. Stokes, manager and engineer of Bexley tramways and electricity undertakings, who was recently appointed general manager of Plymouth Corporation tramways, has been presented with a handsome clock and set of bronzes by the staff of the Bexley electricity and tramways undertakings. The members of the Conservative Working Men's Club gave him an illuminated testimonial, and a silver cup was presented to him by Woolwich Borough Council, in recognition of his work in preparing a decorated tramcar. The presentations were made at an assembly of about 400 at Crayford, when the company bade Mr. Stokes a formal farewell. The presentations were made by Motorman C. Bareham, vice-chairman of the Employees' Works Committee, an organisation established by Mr. Stokes to enable the employees to express their views on conditions of labour. Mr. Bareham said that it was one of the chief ambitions of their manager to bring about amicable relations between himself and his staff, and he had cemented it together with a feeling of brotherhood. Mr. Stokes, in reply, said that he had regarded each one of them as a fellow worker. The excellent results they had achieved could not have been secured by any manager unless every individual on the job had done his bit.

Mr. W. W. Blunt, who is retiring from his post of director of the Metropolitan-Vickers Electrical Company, Ltd., to take up an active partnership in an engineering business with his brother in the United States, was entertained at dinner at the Midland Hotel, Manchester, on October 10, by his colleagues at Trafford Park and the district offices. The company numbered 150, and the sincere evidence of the appreciation of Mr. Blunt as a commercial engineer and a man was a keynote of the evening. Captain R. S. Hilton, managing director of the company, presided, and, in proposing the health of the guest of the evening, said that it was a source of gratification to know that Mr. Blunt retained a connection with the company and would represent it in an important position where he would help to build up and cement the *entente cordiale*, not only between the British Company and the American Company, but between the British and the American nations. Mr. Blunt had seen twenty-three years with the company, and the history of the old British Westinghouse Company was the history of Mr. Blunt. Mr. P. N. Rand then presented Mr. Blunt with a silver coffee service and flask, which had been subscribed for by his colleagues, and a diamond brooch for Mrs. Blunt. In his reply, Mr. Blunt said he would value the gifts throughout his life and the remembrance of his colleagues and friends in this country would mean more to him than he could say. He alluded to the loyal support that had always been given to him by the whole organisation of the old British Westinghouse Company, and he predicted a brilliant future for the Metropolitan-Vickers Electrical Company, Ltd.

FINANCIAL.

Brisbane Electric Tramways Investment Co.—An interim dividend of 8 per cent. per annum (4s. per share), free of tax, has been declared on the ordinary shares for the past half year.

Liverpool Corporation Tramways.—At a meeting of the Tramways and Electricity Committee this week, the chairman (Alderman E. Russell Taylor), stated that the total income had amounted to £753,113 as compared with £632,441, an increase of £120,672. On the other hand the surplus had fallen from £117,663 in 1918 to £58,837, a sum only sufficient to make proper allowance for depreciation and renewals. As compared with 1913 the expenditure of the department had increased by 114 per cent.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended October 15 amounted to £75,744, an increase of £6,708 as compared with the corresponding period last year. The route mileage was 141.67, the same as a year ago. From April 1 (the commencement of the financial year) to October 15 (twenty-eight weeks and two days) the total receipts were £2,309,595, an increase of £455,727 on the corresponding period of 1918.

Wolverhampton Electricity Committee have recommended the acceptance of a tender from the British Westinghouse Company (Metropolitan-Vickers Electrical Co.) for a 250 k.w. rotary converter complete with switchgear, etc., at £2,420.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAME.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	Oct. 7	506	603	+ 97	27	14,981	+ 1,310
Aberdeen Corporation	,, 8	2,567	3,263	+ 696	18½	65 108	+ 14,138
Ayr Corporation	,, 11	430	497	+ 67	21	19,039	+ 3,503
Belfast City	,, 10	9,025	10,274	+ 1,249	28	289,567	+ 64,668
Birkenhead Corporation	,, 12	2,186	3,089	+ 903	27½	81,715	+ 19 218
Birmingham Corporation	,, 4	23.971	27,653	+ 3,682	27	693 894	+ 60,843
do. Motor Buses	,, 4	1,338	1,937	+ 599	27	47,688	+ 16,484
Blackburn Corporation	,, 8	1,598	2,408	+ 810	28½	68,110	+ 15,437
Bradford Corporation	,, 11	10,534	11,544	+ 1,010	28	323,457	+ 62,367
Burnley Corporation	,, 11	2,377	3,202	+ 825	..	..	..
Burton-on-Trent Cor.	,, 12	415	519	+ 104	28	14,177	+ 2,518
Bury Corporation	,, 12	2,076	2,281	+ 205	27½	68,934	+ 10 015
Chatham & District	,, 2	1,282	1,482	+ 200	39	60,344	+ 8,395
Cork Electric	,, 2	594	860	+ 266	39	27,280	+ 2 359
Derby Corporation	,, 11	1,514	1,966	+ 452	28	54,740	+ 11,973
Dundee City	,, 1	1,980	2,663	+ 683	19½	51,902	+ 12,534
East Ham Corporation	,, 11	1,663	2,127	+ 464	27½	54,597	+ 11.328
Edinburgh	,, 4	8,993	11,312	+ 2,319	13½	162,502	+ 32.517
Glasgow Corporation	,, 11	27,792	33 520	+ 5,728	19	617,975	+ 70.198
Glossop (U.E. Sup. Co.)	,, 11	174	228	+ 54	41	9,222	+ 1,783
Huddersfield Corporation	,, 11	3,779	4,816	+ 1,037	28	139,163	+ 30.557
Ilford U.D. Council	,, 11	1,000	1,179	+ 179	27½	34 252	+ 5,862
Ipswich Corporation	,, 11	727	879	+ 152	28	27,268	+ 4,586
Isle of Thanet	,, 8	353	790	+ 437	1½	936	+ 474
Kilmarnock Corporation	,, 11	261	278	+ 17	21½	6,223	+ 299
Lanarkshire	,, 2	4,065	5,316	+ 1,251	39	144,157	+ 1,989
Leeds City	,, 11	14,347	16,227	+ 1,880	28	470,649	+ 96,661
Leicester Corporation	,, 11	4,775	6,326	+ 1,551	..	..	..
Leyton U.D Council	,, 9	2,526	3,675	+ 1,149	28	86,999	+ 24,927
Liverpool Corporation	,, 11	19.181	24,822	+ 5.641	40½	900,104	+ 163,023
London County Council	,, 15	69,036	75,744	+ 6,708	28½	2,309,595	+ 455,727
Maidstone Corporation	,, 9	261	401	+ 140	27½	11,233	+ 3,033
Manchester Corporation	,, 11	27,678	30,733	+ 3,055	28	858,560	+ 137,617
Newcastle-on-Tyne Cor.	,, 11	9,318	9,313	— 5	27	267,991	+ 12,291
Northampton Cor.	,, 3	827	1,140	+ 313	27	34 658	+ 11,174
Nottingham Corporation	,, 9	5,725	7,937	+ 2,212	28	200,748	+ 38,434
Oldham Corporation	,, 12	3,669	4,556	+ 887	29	130,161	+ 27,942
Reading Corporation	,, 2	1,291	1,546	+ 255	26½	44,640	+ 7,633
Rotherham Corporation	,, 8	2,593	2,536	— 57	27½	58,138	— 6,169
Sheffield Corporation	12	13,852	16,376	+ 2,524	28½	477,5.0	+ 82,698
Southampton Cor.	,, 8	2,452	2,518	+ 66	27½	76.368	+ 4,460
,, Motor Buses	,, 8	..	103	..	10	1,111	..
Southend-on-Sea Cor.	Sept. 24	1,463	2,312	+ 849	27	64 906	+ 26,555
South Shields Cor.	Oct. 4	1,164	1,484	+ 319	27	38,889	+ 7,471
Sunderland Corporation	12	2,348	2,682	+ 334	28	82,482	+ 22,758
Torquay Tramways	Aug. 14	1 700	2,019	+ 319	32	34,385	+ 6,037
Tyneside Trys. & Trmrds.	Sept. 24	1,021	1,109	+ 88	13	15,448	+ 1,006
Wallasey Corporation	Oct. 11	1,681	2,399	+ 718	27½	74,966	+ 19,454
Walsall Corporation	,, 11	1,267	1,657	+ 390	28	40.75:	+ 6,058
Walthamstow U.D. Coun.	,, 11	1,406	1,653	+ 247	28	50,112	+ 8,578
Warrington Corporation	Sept. 25	8	[illegible]	+ 1 5	25	22 663	+ 3,426
West Ham Corporation	Oct. 9	4,683	6,428	+ 1,745	27½	151 699	+ 25,483
Wolverhampton	,, 15	1,724	1 863	+ 139	28	57,532	+ 8,347

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Wks.	Aggregate. 1918-19	Increase or Dec.
Anglo-Argentine	Oct. 14	£58,790	£69,079	41	£2,361,785	+ £71,264
Ballarat and Bendigo (4 wks)	July 20	2,948	2,961	16	13,739	+ 394
Brazilian Traction (Mlrs.)	Aug	9,491,000	9,734,000	34	73,767,000	+ 5,118,000
Brisbane	Sept.	35,400	41,970	38	345 370	+ 20,516
British Columbia $	Aug.	544,339	667,170	9	1,309,260	+ 350,953
Buenos Aires Lacroze	S pt.	40,006	45,310	13	137,378	+ 13,410
Burmah Tram. & Light Rs.	Aug. 31	41,855	43,683	4	43,683	+ 1,828
Calcutta Rs.	Oct. 11	82,232	76,152	40½	..	+ 451,841
Carthagena and Herrerias	Sept.	2,549	1,539	35	25,504	— 12,897
Cordoba	Feb.	12,972	13,549	48	159,208	+ 11,492
East India	Sept.	1,939	2,831	8	5,592	+ 1,078
Hong Kong $	Aug. 30	13,989	14,584	35	513,586	+ 36,225
Kalgoorlie	May	2,767	2,796	22	13,196	— 42
La Plata	Sept.	4,999	5,540	39	51,043	+ 4,728
Lima	July	45,964	49,025	30	331,932	+ 29,742
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras Rs.	Sept. 15	35,470	51,193	36	699,455	+ 8,619
Manila $	June	183,250	160,670	26	1,207,412	+ 170,313
Montevideo	Sept.	29,611	35,552	47	404,501	+ 57,428
Para	Aug.	24,672	24,890	39	221,626	+ 3,020
Pernambuco	Oct. 12	2,983	6,045	40½	211,350	+ 31,585
Peruvian $	July	987,300	1,058,730	..	..	..
Rangoon	Sept.	6,067	8,812	39	58,472	+ 2,892
Shanghai (2 weeks) $	Apr 23	50,760	56,755	16	447,279	+ 53,577
Singapore $	Sept. 6	14,847	15,522	36	549,443	+ 52,451
Toronto $	Aug.	1,076,567	1,083,741	34	8,194,299	— 282 373
Winnipeg $	Aug.	288,974	353,194	34	2,565,812	+ 177,345

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SATURDAY, OCTOBER 25, 1919.

THE TRAMWAY WORKERS' OBLIGATION.

With the great improvement in the conditions of tramway employment that has now taken place, the public may reasonably look for a marked increase in the efficiency and the amenity with which the service is conducted. The status of tramway labour has in the past been rather a doubtful matter. In the earlier days of tramways the drivers and conductors were drawn from the ranks of casual labour and they were paid accordingly. The services expected from them were of a corresponding description. Now that employees receive the pay of skilled workmen it is natural and right that there should be a tightening up of discipline and a general raising of the standard of service. It may be hoped that the Joint Council for the industry which has recently been set up will prove an effectual aid in this direction by spreading throughout the rank and file a keener appreciation of their responsibility. Everyone by good and efficient work is helping to drive the social machine and what is needed is an awakening to a realisation of the fact that this helping is a duty. It has been said that every man is a debtor to his profession, and certainly every worker has a duty to the industry from which he derives his livelihood. He can best pay that debt by putting his heart into his work and performing it as efficiently as he can. The idea that he is discharging his obligation to his industry merely by giving the time required is wholly inadequate. The value of service depends mainly upon the ability of the worker and the energy that he puts into his work. In the tramway industry the worker now receives rather more than the economic value of his work and he should be willing to give the fullest service of which he is capable. For 48 hours only out of 168 hours in the week is he now required to be at his post, and at the very least the community has the right to demand that drivers and conductors shall be vigilant, careful, punctual and courteous during their hours of duty. The conductor comes more closely into relation with passengers and he has the opportunity of securing popular approval for the undertaking or of making it a source of public complaint. A thorough knowledge of the district through which the cars run, willingness to impart information, attention to passengers leaving or waiting to board the car and courteous behaviour constitute a modest standard of efficiency in the conductor. Yet this modest standard is by no means generally attained. Improvement lies, however, more largely in the hands of the employees themselves than ever before. Tramway managers are being more and more restricted in the measures they can employ to enforce discipline and increase efficiency. Unless the workers of their own volition seek to improve the tramway services, these will, in spite of the better status of the employees, inevitably deteriorate.

TRAMWAY WAGES ARBITRATION.

A REPORT of the proceedings of the Municipal Tramways Association relating to the application by the National Transport Workers' Federation of July 5 for a further increase in wages has been issued by Mr. J. Beckett, general secretary of the Association. The report which consists of 76 pages (9½in. by 6in.) contains a full account of the proceedings preliminary to the arbitration and sets out the case of the National Transport Workers' Federation. It also gives the list of the undertakings both company and municipal affected, a summary of the address to the Court by Sir Lynden Macassey, which occupies thirty pages, and the decision of the Court awarding an increase of 4s. to workers above 18 years and 2s. to those below. A statement of previous awards is also included.

Sir Lynden Macassey was retained to take the case for all the undertakings that are members of the Municipal Tramways Association, and he also appeared for the undertakings that are members of the Conference of Tramway and Light Railway Companies.

In his account Mr. Beckett says that having regard to the far-reaching issues involved in the application, the Executive Council determined that every undertaking that wished to submit evidence should have the opportunity of doing so, and they regretted that they were powerless to obtain more time for the preparation of the case. The Association was face to face with the application, and the prolonged proceedings and arbitration occurred before it had any central organisation. These circumstances accentuated the haste that characterised the proceedings and the number of authorities which had to give evidence of the critical financial situation of their undertakings added to the difficulties, and compelled the general secretary to turn for assistance to every available source. Upon the clerical staff of Mr. J. M. McElroy, general manager of the Manchester Corporation tramways, great demands were made for the preparation of the schedule of rates of wages paid to the thirty-seven grades of employees named in the application. The task is still unfinished. The information will cover over 150 pages of closely printed tabular matter and will form schedule B referred to in the terms of reference which the Association undertook to prepare at the request of the Ministry of Labour. Attention is directed in the report to the extraordinary circumstance that the Court of Arbitration issued their award without waiting for the schedule of which they made specific mention in the official terms of reference. Such a proceeding is remarkable and probably without precedent in arbitration. Mr. McElroy devoted undivided attention to the preparations for the arbitration for many days, and allusion is made in the course of the report to other members who assisted in various ways in the preparation of the presentation of the case.

The railway strike which took place at midnight on September 25 imported difficulties of transport, and the Court and representatives of the parties were obliged to travel from Glasgow to London by motor conveyance, and from London to Manchester and again to London in the same way.

The pamphlet concludes with a letter from Sir Lynden Macassey to the general secretary, expressing his great appreciation of the efficient way in which the case was organised for presentation to the Interim Court of Arbitration. Sir Lynden remarks that "the time was so short, the facilities afforded so inadequate, and the difficulties caused by the railway strike so great that had it not been for your untiring efforts, your knowledge of the municipalities and your general influence, it would have been quite impossible otherwise to have had the necessary evidence and to have obtained the evidence of the necessary witnesses. With some very considerable experience of wages arbitration, I am bound to say I have never seen a case better organised than was that of the Municipal Tramways Association and that of its constituent members."

Record Tramway Traffic at Hull.—A record was created by the Hull Corporation tramways during the recent fair, when 363,778 passengers were carried in one day, and the receipts amounted to £1,484 8s. 1d. The receipts were not entirely due to the large number of passengers carried, as fares have recently been increased and the 1½d. minimum fare is now effective.

Railway Rates.—Sir Eric Geddes stated in the House of Commons on Wednesday that no general revision of goods rates could be made until the Rates Advisory Committee to be set up under the Ministry of Transport Act had been appointed. He hoped that the last of these appointments would be made within a few days, and the Committee would be asked as their first task to advise upon a scheme for an immediate increase in freight rates.

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L.C.C. TRAMWAY MATTERS.

At the regular weekly meeting of the London County Council on Tuesday, several important reports from the Highways Committee were approved.

MOTOR OMNIBUS SERVICES—BILL TO BE PROMOTED.

A statutory resolution authorising the promotion in the ensuing session of Parliament, of legislation to enable the Council to own omnibuses and to run auxiliary omnibus services in and in the vicinity of the county of London, for linking-up tramway dead ends and for other specific purposes was agreed to unanimously.

TRAMWAY PROPOSALS.

The Highways Committee reported that they had decided not to ask for the suspension of Parliamentary standing orders as it appears that there will be time to secure the approval of the Council to the plans for tramway construction that they desire to promote in the session of 1920.

LOYAL EMPLOYEES REWARDED.

The Highways Committee reported that they desired to place on record their appreciation of the loyalty and co-operation rendered by the staff of the tramways department under the difficult conditions due to the recent strike on the railways. A heavy strain was placed on the traffic staff and all classes of employees who came into contact with the public did their utmost to cope with the emergency. The traffic receipts for the two weeks ended 1st and 8th October amounted to £183,000, while the average weekly receipts for the previous four weeks were about £80,000, or £160,000 for two weeks, showing an increase of £23,000 during the period covered by the strike. It is estimated that the additional expenditure in connection with the strike will not exceed £5,000. The Highways Committee propose that the services rendered by the motormen, conductors and certain other employees should receive special recognition in the form of a grant of a period not exceeding two days' leave with pay to the staff in question. The cost of the proposal would be approximately £9,000.

PROSPECT OF INCREASED FARES.

Mr. W. J. Squires, chairman of the Highways Committee, said that as the ratepayers had to find £94,000 as a result of the recent arbitration, in addition to the increase of £360,000 wages granted last April, it was unlikely that the Council would be able to reduce fares. The condition was rather the reverse. There was such a thing as overloading the willing horse.

Replying to suggestions that have been made as to the establishment of queues and shelters at various points, Mr. Squires said that as they all knew the police had great authority, and in the evidence given before the Select Committee the formation of queues was not encouraged. It was difficult to find space for queues at congested traffic points, but the matter would be carefully considered.

TRAMWAY APPOINTMENTS.

The London County Council in 1917 adopted a scheme for the reorganisation of the tramways department on a comprehensive basis. This scheme has since been amplified, and as authorised by the Council the Highways Committee recently issued advertisements inviting applications for the undermentioned positions. The salaries named are based on pre-war conditions and are subject to temporary war allowances in each case :—

(I.) Rolling stock engineer (£1,000 to £1,200 a year) ;
(II.) Permanent way engineer (£800 to £1,000 a year) ;
(III.) Assistant electrical engineer (£600 to £800 a year) ;
(IV.) Traffic operation superintendent (£600 to £800 a year) ;
(V.) Traffic statistics assistant (£300 to £400 a year) ; and
(VI.) Sub-station superintendents (two) (£250 to £300 a year).

For the position of permanent way engineer 42 applications were received, but the Highways Committee recommended that for the present the existing arrangements should be continued, whereby Mr. J. B. Welling acts as permanent way engineer at a salary of £750 a year.

For the other positions a number of applications were received and the Committee interviewed the six candidates considered most suitable for each position.

The following candidates were placed on a short list :—

ROLLING STOCK ENGINEER.—Capt. E. H. Cockshott, assistant to manager for maintenance and construction and technical engineer, London Electric Railway Co., Ltd. ; Mr. W. E. Ireland, acting rolling stock engineer, L.C.C. Tramways ; Mr. T. Ridyard, rolling stock and works superintendent, Liverpool Corporation Tramways.

ASSISTANT ELECTRICAL ENGINEER.—Mr. G. D. Meynell, assistant engineer, Victoria Falls and Transvaal Power Co. ; Mr. R. W. Willis, principal assistant to Mr. C. H. Wordingham, consulting engineer ; Mr. W. Yorke, deputy electrical engineer to British Cellulose Co.

TRAFFIC OPERATION SUPERINTENDENT.—Mr. S. R. Geary, divisional traffic superintendent, L. C. C. Tramways; Mr. W. J. McCombe, late manager, Hull Corporation Tramways ; Mr. W. H. Stradling, assistant manager, Bristol Tramways and Carriage Co., Ltd.

TRAFFIC STATISTICS ASSISTANT.—Mr. C. G. Parker, 1st class assistant, valuer's department (previously in local government and statistical department) ; Mr. G. Potter, assistant, traffic branch L.C.C. tramways ; Mr. F. Scothorne, 1st class assistant, valuer's department (previously in local government and statistical department.)

The Highways Committee recommended that :—

Mr. W. E. Ireland be promoted rolling stock engineer at a salary of £1,000 a year, rising by annual increments of £50 to a maximum of £1,200 a year, together with temporary war allowances of 10 per cent., plus £80 a year.

Mr. R. W. Willis be appointed assistant electrical engineer at a salary of £600, rising by annual increments of £25 to £700 and thence by two annual increments of £50 to a maximum of £800, with temporary war allowances of 20 per cent. plus £90 a year.

Mr. S. R. Geary be promoted traffic operation superintendent at a salary of £600 a year, rising by annual increments of £50 to a maximum of £800 a year, with temporary war allowances of 15 per cent. on a salary of less than £800 a year and 10 per cent. on £800 a year, and war bonus varying from £62 10s. a year to £80 a year according to salary.

Mr. Frederick Scothorne be transferred from the valuer's department and appointed traffic statistics assistant at a salary of £300 a year, rising by annual increments of £25 to a maximum of £400 a year, together with a temporary war allowance of 20 per cent. and war bonus of £70 to £73 a year.

Mr. H. H. Bullock and Mr. H. J. Morris be appointed sub-station superintendents at a salary of £250 a year, rising by annual increments of £12 10s. a year to a maximum of £300 a year, together with temporary war allowances of 20 per cent., plus £90 a year.

OVERTURNED LONDON TRAMCAR.

BOARD OF TRADE REPORT.

Major J. W. Pringle has reported to the Board of Trade the result of his inquiry into the accident which occurred on August 16th, at the junction of Great College Street with Pancras Road on the London County Council tramways, when a car was overturned. Major Pringle's conclusions are that the hand and magnetic brakes were in proper working order, that the speed of the car approaching the compulsory stopping place was higher than 16 miles an hour, that the magnetic brake was in all probability not utilised early enough to check the speed of the car and bring it to a standstill at the required point, that eventually at least, owing to over forcible use of the hand brake in conjunction with the magnetic brake, locking of the wheels resulted which caused derailment at the sharpest part of the curve and the subsequent overturning of the car.

The accident illustrates, says Major Pringle, the danger, especially with worn and shallow flanges which are nowadays inevitable from travelling over much worn rails, that is likely to arise from higher speeds than those authorised if over hasty and forcible applications of the hand and magnetic brakes are made. The attention of motormen should be called to this point, and to the necessity for observing speed restrictions. The compulsory stopping place in Great College Street is placed on the curve, but in the interests of safety the dead stop should be made before the curve commences.

INCREASE IN FARES.

Birmingham Tramways Committee is considering the question of a further revision of fares. Owing to bonuses and many other concessions the tramway men are now costing the Corporation £417,511 per annum more than in 1914.

In consideration of the Paisley Town Council withdrawing their objection to the general increase in fares, which provides for a minimum charge of 1d., and the abolition of the halfpenny fares, the Paisley District Tramways Company have agreed not to insist upon the proposed increase in fares on Sundays and holidays. The Company are now awaiting the sanction of the Board of Trade to the advance in charges under the new schedule.

Wolverhampton Town Council have agreed to the increase in fares proposed by the Tramways Committee on all parts of the tramway system by a halfpenny, the minimum ordinary fares to be 1½d. The Chairman of the Tramways Committee, Alderman Sir Charles T. Mander, said that the last award had added £3,000 per annum to the cost of tramway operation. Taking all factors into consideration, the total increase in the operating rate was no less than 150 per cent. above pre-war running costs. The total costs were 22.94d., and the receipts based upon the present fares were 18.5d., which represented a loss of 4.44d., or £22,200 on the year's working.

ADVISORY COMMITTEE ON LONDON TRAFFIC.

Sir Eric Geddes, Minister of Transport, in reply to questions in the House of Commons on Wednesday, said that the Government having considered the report of the Select Committee on London Traffic had decided that all questions of traffic in the London area should be dealt with by the Ministry of Transport. An Advisory Committee selected broadly on the lines of the recommendations of the Select Committee would be appointed to advise and assist the Minister. It will be remembered that the Select Committee recommended the establishment of a committee of five members as a maximum, one representing the Home Office, one the Ministry of Transport, one the London County Council, one the local authorities outside the administrative County of London, with an independent chairman.

Kearney-High Speed Railway.—It is reported that Barking District Council propose to contribute £20,000 towards the construction of a mile of the Kearney high-speed railway.

Termination of the War.—Mr. Bonar Law said in the House of Commons on Wednesday that it was not possible at present to say when an Order in Council would be promulgated fixing the termination of the war.

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MISCELLANEOUS NEWS AND NOTES.

Women Conductors in London.—The Highways Committee of the London County Council have authorised the general manager of the tramways, Mr. A. L. C. Fell, to take the necessary steps to terminate the employment of women conductors.

Increased Wages at Alexandria.—A *Times* telegram states that the strike of tramway men in Alexandria has come to an end, the men having been granted 40 per cent. increase in wages and an eight-hour day.

Tramway Company and Road Repairs.—The Birmingham District Power and Traction Company has offered to pay £2,500 towards defraying the cost of repairing part of the Smethwick main thoroughfare.

Two Hundred Motor Wagons Needed.—It is reported that two hundred motor wagons will be needed to clear the Port of Manchester of congested traffic, but the first call of the Ministry of Transport will be for a much smaller number.

Motors for Manchester.—In the estimates of Manchester Corporation Tramways Committee there is included £20,000 for petrol and other mechanical vehicles and £35,000 for twenty motor omnibuses at £1,750 each.

Fined for Obstruction.—It having been proved that he had wilfully obstructed a tramcar for nine minutes by refusing to pull his cart off the track, a carter was fined £2 with two guineas costs at Willesden.

Fares Collection at Kirkcaldy.—Owing to authentic reports that half the fares of passengers on crowded tramcars are not collected, Kirkcaldy Town Council has remitted to the Tramway Committee the duty of devising a scheme for collecting the fares more efficiently.

Free Rides for Incapacitated Ex-Service Men.—Stockport Tramways Committee have granted the request of the League of Comrades in the Great War that incapacitated ex-service men should be allowed the free use of the car service.

New Motor Omnibus Service at Liverpool.—A new motor omnibus service has been provided between the Pier Head and Shell Road during the rush hours in the morning and evening. The *Liverpool Post* remarks that the auxiliary aid of these well appointed and speedy motors is greatly appreciated.

Motor Chars-a-Banc Service at Bradford.—In Bradford some motor chars-à-bancs have been running along the tramway routes during times of abnormal pressure. A local paper reports that persons have been heard to express the hope that the service will be continued until more tramcars are available.

Presentation to Women Conductors.—Between two and three thousand past and present women employees of the London Underground Railway and the London General Omnibus Company have been presented with certificates of service showing the part each played in the war. The presentation was made at the People's Palace on October 21 by Mr. H. E. Blain, operating manager.

Trailer Cars and Motor Omnibuses for Salford.—The Tramway Committee of Salford propose to insert a clause in the Parliamentary Bill asking for power to use trailer cars and also to run motor omnibuses in various parts of the borough. Mr. G. W. Holford, the general manager, has been directed to make inquiries with a view to the purchase of motor omnibuses.

Use for a Raid-Shattered Tramcar.—Sunderland Corporation Tramway Department have made a truck for conveying sand from Roker to the tramway depot out of a tramcar which was shattered by one of the bombs dropped by the German airmen in the great air raid of 1916. It is coupled to an ordinary tramcar, and hauled along the lines.

Manchester Tramway Schemes.—Further particulars of the tramway schemes to be submitted to Manchester City Council at a special meeting to be held on Wednesday, October 29, have been published. Besides the street widenings and tramway linking extensions proposed, specified in our issue of 11th inst., powers are being sought to construct additional tramways, and to borrow £1,100,000 for the purpose.

The Institution of Automobile Engineers.—The second meeting of the session of the Institution of Automobile Engineers will be held at the Royal Society of Arts, John Street, Adelphi, W.C.2, on Wednesday, November 5, 1919, at 8 p.m., when Dr. L. Aitchison will read a paper entitled "Valve Failures and Valve Steels in Internal Combustion Engines." A card of invitation to the meeting may be obtained on application to the Secretary, Institution of Automobile Engineers, 28, Victoria Street, London, S.W.1.

Overhanging Trees.—The Roads Department of the Ministry of Transport has sent a letter to county and municipal authorities stating that numerous complaints have been received by the Ministry from omnibus and chars-à-banc proprietors calling attention to the danger from overhanging branches of trees. The Ministry expresses the hope that advantage will be taken during the present season to remove all obstructions and that the trees and hedges will be lopped as provided by statute.

Extensions at Cardiff.—Directions were given by the Cardiff Parliamentary Committee recently, to the city engineer and the tramways manager to include in the Corporation Bill powers to extend the tramways from the Cowbridge Road terminus to the junction of the road leading to Caerau at Ely, from the Whitchurch Road terminus to the North Road, from Albany Road to Newport Road, from Newport Road to Moira Place, through Fitzalan Road, and through Duke Street after its widening. The Bill will also seek powers to run motor omnibuses throughout the area which it is intended to bring within the city boundaries in order to act as feeders to the tramways.

Tramcar Driver's Dismissal.—Ayr Town Council, at a recent meeting, had before them the appeal of the Tramway Workers' Union against the dismissal of a tramcar driver. After hearing the objections of the men's representative to the dismissal, and taking the evidence of a lady passenger and the tramway manager, the Council resolved to take no action in the matter, refusing to reinstate the driver.

Cost of Increased Wages at Blackpool.—The Blackpool Tramways and Electricity Committee have accepted the result of the recent arbitration, which will cost the department £3,200 a year. The total war advances to date aggregate £45,000 a year. Blackpool is one of the few towns in which the tramway fares have not been increased or the length of stages reduced during the war, but it is probable that a revision of fares cannot be long delayed.

The Industrial League and Council.—The Industrial League and the Reconstruction Council have now combined forces and the new organisation is known as the Industrial League and Council. The annual dinner held on Wednesday was very largely attended. Mr. G. H. Roberts, Minister of Food, presided and the guest of the evening was Lieut.-Col. John Ward. During the past year the league has grown rapidly, and it is performing a very useful part in promoting good relations between employers and employees.

Driver Falls from Car in a Faint.—While a tramcar was running along a street in Aberdeen the driver fainted and fell off, leaving the vehicle to run on. It dashed into a carriage conveying infirm children to school, with two nurses, but though the carriage was overturned, the inmates received nothing more than a severe shaking. How much more damage might have been done it is impossible to say, for a young man, who was one of the numerous passengers on the upper deck, ran down the front steps, and managed to stop the car, though quite ignorant of the mechanism.

New Workshops at Edinburgh.—At a meeting of the Edinburgh Town Council on October 15, Mr. R. S. Pilcher, general manager of the Corporation tramways, reported that the actual cost of the increase to the tramway employees as a result of the recent arbitration would be £10,033. The Committee approved the extension of Shrubhill workshops. The new buildings will cost £12,000, and alterations and new machines for the machine shops £3,500. In view of the expected electrification of the Pilrig and Liberton sections of the tramways, the proposed extension of the car sheds and stores at Shrubhill was delayed for further consideration.

International Tramways Union.—At the meeting of the London County Council on Tuesday, the Council approved the continuation of its membership in the reconstituted International Tramways Union. Owing to the changes in the international situation as a result of the war, the old Union was, as reported in our issue of June 19, dissolved and immediately reconstituted with members belonging to the entente and neutral countries only. The annual subscription to the Union is based on the gross receipts of the constituent members, and in the case of the London County Council amounts to £12 a year. This subscription enables the Council to send one representative to the biennial congress if desired.

The Roads and Transport Exhibition which will be held at the Royal Agricultural Hall from November 20 to 27, will be opened by Sir Eric Geddes, the Minister of Transport, who has accepted the presidency of the Exhibition and the Road Transport Congress. Brigadier-General Sir H. P. Maybury, K.C.M.G., C.B., and Major-General Sir Philip Nash, K.C.M.G., C.B., have consented to act as vice-presidents. The whole of the space in the Agricultural Hall has been allotted to exhibitors. In addition to the Road Transport Congress organised by the County Councils Association, the Institution of Municipal and County Engineers will hold a conference on Housing.

FINANCIAL.

Callender's Cable and Construction Company, Ltd., has declared an interim dividend of 5s. per share, less tax, on the ordinary shares.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended October 22 amounted to £76,109, an increase of £12,610 as compared with the corresponding period last year. The route mileage was 141.67, the same as a year ago. From April 1 (the commencement of the financial year) to October 22 (twenty-nine weeks and two days) the total receipts were £2,385,753, an increase of £468,387 on the corresponding period of 1918.

Dundee, Broughty Ferry and District.—The report of the Dundee, Broughty Ferry and District Tramways Company for the year ended July 31 last states that the profit (including £83 brought forward) amounts to £5,053. From this falls to be deducted:—Interest on debenture stock, £1,203; interim dividend on preference shares, £1,050, leaving £3,400, which the directors propose to deal with as follows:—To pay final dividend on preference shares, £1,050, dividend on ordinary shares at the rate of 5 per cent. per annum for year, less tax, £1,006; to place to reserve fund £1,000 and to carry forward £344. In moving the adoption of the report, Mr. George Balfour, the Chairman of the Company, said it was quite impossible for the small tramway undertakings in the country to bear any increased expenditure without an increase being made to the present maximum fares allowed by statute, and if further increase had to be borne the directors would perhaps have to take steps to apply for the necessary authority to increase the fares at present authorised in order to meet these arbitrarily increased burdens. Mr. David Hynd seconded, and the report was approved. The Chairman and Mr. Edward Cowan were re-elected directors.

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Hurst, Nelson and Company's Capitalisation Scheme.—The report of Messrs. Hurst, Nelson and Co., of Motherwell, gives particulars of the scheme of capitalisation proposed by the directors of the company. The capital is now £320,000, of which £200,000 is preference and £120,000 ordinary, all in £10 shares. These it is proposed to divide into shares of £1, and the capital is to be enlarged to £400,000 by the creation of 80,000 new ordinary £1 shares. Of these 20,000 will go as bonus to the preference holders and 60,000 to the ordinary shareholders. The capital will then be equally divided between the two classes of shares. In the year to July 13, 1919, the gross profit was £84,224, against £88,992 for the same period in 1918, and the net £55,960, against £56,764. The dividend and bonus of 15 per cent., free of tax, and the appropriation of £20,000 to reserve are repeated, and after reserving for the interim dividend, £20,804 goes forward, against £20,843. The reserve is brought up to £110,000, independently of the £36,000 of preference dividend reserve, and of this £80,000 will be capitalised under the scheme.

PERSONAL.

Mr. S. R. Windle, of Sunderland, has been appointed electrical engineer of Doncaster Corporation.

Mr. T. Potts, who has been traffic manager of Doncaster tramways, has been appointed tramways manager at a commencing salary of £350 per annum.

The death is announced of **Mr. T. R. Knowles,** chief engineer of the Patent Shaft and Axletree Company. Mr. Knowles was a member of the Wednesbury Town Council.

Mr. Walter Jackson, who recently visited a number of tramway undertakings in this country, and has since contributed a series of informing articles to the *Electric Rai'way Journal* of New York, has resigned after seventeen years' service with that journal to specialise as a consultant on electric railway fares and motor omnibus operation. Mr. Jackson's address is 567, Eighth Street, Brooklyn, New York.

Mr. W. Tuke Robson, formerly general manager of Southampton Corporation tramways, sailed in the *Mauretania* on October 18 for a business tour in the United States and Canada. On the evening before his departure he was presented with a silver pipe case and pipe and an antique silver tobacco box as a token of appreciation and respect from the members of the Southampton Corporation Tramways Employees' Social and Athletic Club. The presentation was made by Alderman F. A. Dunsford, chairman of the Southampton Tramways Committee, who was supported by Mr. J. Dobson, the new manager, and Mr. Dixon, the works superintendent. Alderman Dunsford, speaking on behalf of the Corporation, expressed their pleasure at seeing Mr. Robson restored to health. He was sure that the cause of his breakdown was the very great stress put upon him during the war, which few men could have withstood. The Southampton tramways had had more work put upon them than any other service in the country, and it was wonderful how such a splendid service had been maintained, taking into consideration the fact that the men had been replaced by women as conductors. The passengers came from all parts of the world, and even German prisoners had been carried by the tramways. It was solely owing to Mr. Robson's hard work night and day and his personal contact with all his staff that such excellent results had been achieved. He deplored his loss greatly, and he wished him the best of health and success in his new undertaking, and a safe return. The remarks made by representatives of both the men and women employees testified to the good relationship which existed between Mr. Robson and the staff. In a few words of farewell Mr. Robson expressed his thanks for the gifts and his appreciation of the kind words of Alderman Dunsford. He would always remember the part the members of the staff had played in the success of the undertaking during the war. Mr. Robson was entertained at a luncheon given by the members of the local Rotary Club before his departure. There was a large company at the quayside when the *Mauretania* left on Saturday night to wish him a pleasant voyage. He hopes to be in London by Christmas after an extended tour through the United States and Canada, in the course of which he proposes to inspect a large number of tramway and railway undertakings.

CONTRACTS AND ORDERS.

J. W. Courtenay, Ltd., of Amberley House, Norfolk Street, Strand, London, W.C., have been appointed sole advertising contractors for the Aberdare Council tramways.

The Metropolitan-Vickers Electrical Co., Ltd., have obtained a contract for switchgear extensions at £1,240, at Barnsley Electricity Works.

BUSINESS NOTE.

The General Seating Company, Ltd., have removed their offices to 162, Grosvenor Road, Westminster, S.W.1. Their telegraphic address is now "Cushioning, Churton, London," and their telephone number "Victoria 6290 and 6291."

SIGNALLING SYSTEMS FOR STREET TRAFFIC.

The proprietor of British Patent No. 24392 of 1914, relating to "Signalling Systems for controlling street traffic," desires to enter into negotiations with one or more firms in Great Britain for the sale of the patent rights or for the grant of licences to manufacture under royalty.

Enquiries to be addressed to D. Young & Co., Patent Agents, & 12, Southampton Buildings, London, W.C.2.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

NAMES.	Week ended	Latest Return. 1918	1918	Incr. or Dec.	Aggregate. Wks.	1918.	Incr. or Dec.
Aberdare U.D.C.	Oct. 14	520	522	+ 2	28	15,503	+ 1,312
Aberdeen Corporation	„ 15	2,488	2,996	+ 513	1 9	68,105	+ 4,552
Ayr Corporation	„ 18	407	482	+ 75	22	20,522	+ 3,579
Belfast City	„ 17	8,941	10,274	+ 1,333	29	299 841	+ 66,001
Birkenhead Corporation	„ 19	2,163	3,014	+ 851	28½	84,729	+ 20 068
Birmingham Corporation	„ 11	24,766	26,466	+ 1,700	28	720 360	+ 62,548
do. Motor Buses	„ 11	1,389	1,777	+ 388	28	49,465	+ 6,872
Blackburn Corporation	„ 15	1,797	2,016	+ 219	29½	70,126	+ 15.729
Bradford Corporation	„ 11	10,534	11,544	+ 1,010	28	323,457	+ 62,367
Burnley Corporation	„ 18	2,356	2,896	+ 540	...	...	...
Burton-on-Trent Cor.	„ 19	406	491	+ 85	29½	14,668	+ 2,602
Bury Corporation	„ 20	1,990	2,192	+ 202	28½	71,126	+ 10,216
Chatham & District	„ 9	1,302	1,506	+ 204	40	61,850	+ 8,599
Cork Electric	„ 9	588	878	+ 290	40	28,185	+ 2.649
Derby Corporation	„ 18	1,498	1,899	+ 401	29	56,640	+ 12,374
Dundee City	„ 15	1,920	2,430	+ 510	2½	57,087	+ 13,871
East Ham Corporation	„ 18	1,702	1,834	+ 132	28½	56,432	+ 11,460
Edinburgh	„ 11	8,549	10,813	+ 19.64	14½	178,317	+ 34.281
Glasgow Corporation	„ 19	28,271	32 886	+ 10,615	20	650,862	+ 74.510
Glossop (U.E. Sup. Co.)	„ 18	166	208	+ 42	42	9,430	+ 1,824
Huddersfield Corporation	„ 18	3,775	4,688	+ 913	29	148,851	+ 31,470
Ilford U.D. Council	„ 18	978	1,082	+ 104	28½	35 335	+ 5,962
Ipswich Corporation	„ 18	667	846	+ 179	29	28,114	+ 4,769
Isle of Thanet	„ 15	315	688	+ 322	2½	1,574	+ 796
Kilmarnock Corporation	„ 18	252	277	+ 25	22½	6,500	+ 723
Lanarkshire	„ 9	3,488	4,488	+ 1,000	40	148,645	+ 2,988
Leeds City	„ 18	14,435	15,826	+ 1,391	29	486,477	+ 98,016
Leicester Corporation	„ 18	4,560	5,926	+ 1,366	...	...	...
Leyton U.D Council	„ 16	2,442	2,860	+ 418	29	92,859	+ 25,345
Liverpool Corporation	„ 18	19,028	23,978	+ 4,880	41½	924,084	+ 107,906
London County Council	„ 22	63,499	76,109	+ 12,610	29½	2,355,753	+ 448,387
Maidstone Corporation	„ 16	256	356	+ 97	28½	11,590	+ 3,121
Manchester Corporation	„ 11	27,678	30,733	+ 3,055	28	858,560	+ 157,617
Newcastle-on-Tyne Cor.	„ 18	9,275	9,108	— 167	28	277,100	+ 11,956
Northampton Cor.	„ 3	827	1,140	+ 313	27	34,658	+ 11,174
Nottingham Corporation	„ 16	5,878	7,003	+ 1,130	29	207,752	+ 39,565
Oldham Corporation	„ 19	3,488	4,390	+ 902	30	134,552	+ 28,844
Reading Corporation	„ 9	1,296	1,515	+ 219	27½	45,021	+ 7,872
Rotherham Corporation	„ 15	2,591	2,076	— 515	28½	60,215	— 6,683
Sheffield Corporation	„ 19	13,505	16,288	+ 2,783	29½	487,806	+ 85,481
Southampton Cor.	„ 15	2,409	2,375	— 34	28½	78,744	+ 4,476
„ Motor Buses	„	...	136	...	11	1,248	...
Southend-on-Sea Cor.	Sept. 24	1,468	2,312	+ 849	27	64 906	+ 26,555
South Shields Cor.	Oct. 4	1,164	1,484	+ 319	27	38,889	+ 7,471
St. Helens Corporation	„ 14	...	1,589	...	2	3,583	...
Sunderland Corporation	„ 19	2,283	2,659	+ 376	29	85,142	+ 23,135
Torquay Tramways	Aug. 14	1,700	2,019	+ 319	32	24,985	+ 6,037
Tyneside Trys. & Trmrds.	Oct. 1	993	2,000	+ 1,007	14	17,458	+ 2,014
Wallasey Corporation	„ 18	1,642	2,245	+ 603	28½	76,612	+ 20,057
Walsall Corporation	„ 11	1,267	1,657	+ 390	28	40,751	+ 6,058
Walthamstow U.D. Coun.	„ 18	1,373	1,488	+ 115	29	51,601	+ 6,677
Warrington Corporation	Sept. 25	809	924	115	25	22.663	+ 3,426
West Ham Corporation	Oct. 16	4,524	4,957	+ 433	28½	156,656	+ 25,916
Wolverhampton	„ 22	1,639	1 989	+ 350	29	59.521	+ 8,696

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Oct. 14	£58,790	£69,079	41	£2,861,785	+ £71,264
Ballarat and Bendigo(4 wks)	July 20	2,948	2,981	16	13,799	+ 324
Brazilian Traction (Mirs.)	Aug	9,491,000	9,734,000	34	73,767,000	+ 5,118,000
Brisbane	Sept.	35,400	41,970	38	346 370	+ 20,516
British Columbia $	Aug.	544,339	667,170	9	1,302,260	+ 350,963
Buenos Aires Lacroze	S pt.	40,006	45,310	13	137,378	+ 13,410
Burmah Tram. & Light Rs.	Sept.	30,836	43,152	8	86,635	+ 14,144
Calcutta Rs.	Oct. 11	82,132	76,152	40½	...	+ 451,841
Carthagena and Herrerias	Sept.	2,549	1,539	35	25,504	— 12,897
Cordoba	Feb.	12,972	13,549	48	159,208	+ 11,492
East India	Sept.	1,939	2,831	8	5,542	+ 1,678
Hong Kong $	Sept. 6	15,599	15,480	36	529,466	+ 36,106
Kalgoorlie	June	2,747	2,646	26	15,842	— 113
La Plata	Sept.	4,999	5,540	39	51,043	+ 4,728
Lima	July	45,964	49,025	30	331,932	+ 29,742
Lisbon Escu.	Mar.	238,299	276,625	...	...	...
Madras (2 weeks) Rs.	Oct. 15	39,924	47,890	40	791,902	+ 70,602
Manila $	June	183,250	160,670	26	1,207,412	+ 170,313
Montevideo	Sept.	29,611	25,552	47	404,501	+ 37,428
Para	Sept.	23,442	24,326	43	246,012	+ 3,964
Pernambuco	Oct. 19	3,101	6,119	41½	217,469	+ 24,603
Peruvian $	July	987,300	1,058,730	...	...	...
Rangoon	Sept.	6,067	8,812	39	58,472	+ 2,892
Shanghai (2 weeks) $	Apr 23	50,760	56,755	16	447,279	+ 53,577
Singapore $	Sept. 6	14,847	15,522	36	549,443	+ 52,451
Toronto $	Aug.	1,070,567	1,083,741	34	8,194,299	— 282 373
Winnipeg $	Aug.	288,974	353,194	34	2,565,812	+ 177,345

CARS, MOTORS, CONTROLLERS.

(DICK, KERR SYSTEM.)

THE ENGLISH ELECTRIC COMPANY LIMITED,

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THE
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SATURDAY, NOVEMBER 1, 1919.

TRAMWAY EXTENSIONS IN LONDON.

Elsewhere particulars are given of tramway schemes which the Highways Committee of the London County Council suggest are needed in order that the undertaking may be worked as a unified system. From that point of view the greater part of the proposals at least are commendable, and it may be hoped that they will receive the approval of the Council on Tuesday next. In accordance with the standing orders of the Council all proposals involving capital expenditure have to be deferred for a week, and consequently no action could be taken at the last meeting. The plans are remarkable as indicating the advance that the Moderate majority of the Committee have made in viewing the traffic requirements of the Metropolis. Projects estimated to cost over four millions are recommended for the next session of Parliament, and other schemes calculated to require an outlay of a similar amount are left for future consideration. Spread over the first list are various street improvements totalling £900,000, that sum being included in the estimates. More than half of the proposals allocated to next session are connecting lines required in one case for the linking of the southern and northern systems, and for relieving congested centres by links with existing lines and proposed constructions. In several instances these projects date back a dozen years, and have either failed to secure the assent of former County Councils or obtain parliamentary approval in face of opposition. The necessity for these extensions was forcibly brought home to the Council in the report which they obtained from M. Mariage, managing director of the General Omnibus Company of Paris, before the outbreak of the war. If that conflagration had not occurred it is safe to conclude that by this time the suggestions contained in his report would have been translated into achievements. Of those schemes it is not unreasonable to hope that Parliament will take a view more consonant with the public interest than has been done by the City Corporation and the borough councils. Despite the popularity of the omnibus, it is absurd to urge, as opponents of tramways are doing, that the latter vehicle is in possession of the field. The omnibus is much more expensive per passenger carried than the tramway car, and the former can never deal with the crush of traffic that exists at certain points. Notwithstanding the lack of proper facilities for loading, there are, for instance, probably more than one hundred double-deck bogie cars per hour despatched from the terminus at Victoria, and to put two hundred omnibuses on the task would render the street impassable. Another scheme for which immediate justification can be shown is the extension from Wandsworth High Street to Roehampton Lane. This will be needed to provide for the great housing scheme decided upon at Roehampton. For the *Morning Post* to assert that any extension of the London tramways "is essentially a question to be decided not by the County Council, but by a separate authority charged with the organisation of all London traffic, and having in view the general and not a particular interest," is to beat the air. After urgent exhortation by the Select Committee of the House of Commons, the Government refused to establish a Traffic Board for London. It is true that an advisory committee is being formed by the Ministry of Transport. In the meantime, however, Sir E. Geddes has his hands full with the problem of railway unification, and of making the railways self-supporting. He is also faced with the additional task of road administration, to say nothing of the oversight of the State electricity undertaking; and the people of London cannot wait. An ideal system of transport will not be evolved in this generation. What is wanted is immediate practical action that will provide some amelioration of existing conditions. The London General Omnibus Company is ably performing its part, and the London County Council tramways should be put in such a position that they too can give the utmost service that a properly designed tramway system can provide. Although much criticised, the fact is that the Council's tramways have given magnificent service in the face of the most harassing difficulties. It is time that some of these difficulties were swept away. As regards the question of relative costs, let it not be forgotten that it is essential to the mass of London travellers that they should be carried at the least possible cost. That condition alone makes the tramway imperative. There is no cheaper means of traction than "a metal wheel on a metal rail."

INCREASE IN FARES.

Alderman H. B. Varwell, chairman of Exeter Tramways Committee, referring to the increase of wages under the recent arbitration, said that they had very heavy expenditure ahead, and he was afraid that in spite of the recent increase in fares the tramways would come on the rates. Alderman Munro remarked that when that time came the Council would have to consider the stoppage of the tramways altogether. If the loss was more than the interest and sinking fund it would be questionable whether it would be worth while to carry on the undertaking.

Mr. R. Stuart Pilcher, the general manager, in a report on the financial position of the Edinburgh tramways undertaking under Corporation management, suggests that it is probable that a further increase in fares will be necessary if the undertaking is not to incur a deficit. The manager remarks that in view of the experience of the last three months' work and the effect of the last wages award, the Committee will require to reconsider the present fares.

Portsmouth Tramways Committee have recommended the Borough Council to increase the fares on the Corporation tramways by 50 per cent. The recent wages award will add £6,850 per year to the expenses and the reduction of hours from 56½ per week to 48 will add £17,888, giving a total increase in wages as compared with the amount paid at the beginning of the war of £49,730. The motormen now receive a maximum wage of £3 16s. 0d. per week compared with 31s. before the war. The Committee realise that an increase in fares is the only way to keep the undertaking off the rates.

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L.C.C. TRAMWAY MATTERS.

At the weekly meeting of the London County Council, the Highways Committee submitted several important reports relating to the tramways. The most important dealt with proposals for the construction of new tramways comprising about ninety miles of track. Particulars of the scheme are given below.

TURBO-ALTERNATOR SET AT GREENWICH.

The Committee reported that considerable trouble has been caused recently at Greenwich power station owing to breakdowns of the three 8,000 k.w. turbo-alternator sets. The trouble appears to be due to difficulties in the alternators, and the Committee have been considering what steps should be taken for the repair of the plant, but in the meantime it is proposed to install a spare alternator and rotor on the bed-plate of any of the three sets in the event of any one of them breaking down. The cost of the work is estimated at £22,500. The Finance Committee approved the estimate and submitted the same as chargeable to capital 15 years' account.

TOOLEY STREET TRAMWAYS.

The London County Council Tramways and Improvement Act 1912, authorised the construction of a tramway in Tooley Street from Bermondsey Street to Joiner Street, but provided that this tramway should not be used between 9.30 a.m. and 5.30 p.m. on any week day or between 9.30 a.m. and 12 noon on any Saturday. The tramway has proved very useful, but the restriction preventing the cars from coming up to London Bridge terminus at all times of the day has been found very inconvenient to the public. The Highways Committee advise that an application be made to Parliament for the removal of the restriction.

PUBLICITY ASSISTANT.

In the reorganisation of the tramways department adopted by the Council on February 20, 1917, it was proposed that a publicity assistant should be appointed, and that the salary, based on pre-war conditions, should be £300, rising by annual increments of £25 to £400 a year. In reply to an advertisement 234 applications had been received and the Highways Committee recommended that Mr. W. W. J. Studd be appointed on probation for a period of six months at the salary proposed, with a temporary war allowance of 20 per cent., plus a temporary war bonus rising from £70 to £73 a year.

MR. W. J. SQUIRES, chairman of the Highways Committee, stated that the Minister of Transport has consented to receive a deputation at an early date on the question of setting up of a body to consider tramway schemes for London as a whole.

LONDON TRAMWAY EXTENSION.

LEGISLATIVE PROPOSALS BEFORE THE LONDON COUNTY COUNCIL.

During the period of the war, owing to the restrictions imposed by the Treasury and other reasons, no new tramway schemes were put forward by the London County Council, and consequently the tramways system is quite inadequate to the present demands for travelling facilities that are required to meet the development of traffic which has taken place in recent years. To enable the Council to provide facilities to meet the situation, the Highways Committee at the Council Meeting on Tuesday, brought up a long report outlining a scheme of tramway development which would include the construction of about ninety miles of single line of new tramways. The capital expenditure involved would be about £5,344,340 for tramway works and £2,770,650 for street improvements, making a total of £8,114,990.

Certain of the new tramways proposed are in the opinion of the Highways Committee, of special urgency, as, for instance the connection between the tramways in Farringdon Road and Blackfriars Bridge, to join up the northern and southern tramway systems. The lines of special urgency include seventeen, with an aggregate length of nearly forty-three miles. Most of these would be constructed on the conduit system, but for five of them it is proposed to use a combined conduit and overhead system. The estimated cost of the new tramways for which it is suggested that powers should be sought in the next session is as follows :—Tramway works, £3,031,695 ; spare cars and high tension cables, £245,100 ; street improvements, £928,550 ; total, £4,205,345.

The Committee asked the Council to look at the results to be derived from the proposals as a whole taken in conjunction with the effect they would have in developing traffic on the existing lines. While individual lines proposed taken by themselves might not appear to be financially advantageous, the Committee expressed the confident hope that the construction of the whole group of tramways would be fully justified on financial grounds.

In accordance with the standing orders, which require a delay of a week, a decision on the proposals was costponed until Tuesday next.

Rhondda Dismissed Tramway Driver Reinstated.—A settlement of the Rhondda tramway dispute was obtained last week by the intervention of local miners' leaders. A driver had been dismissed by the manager of the Rhondda Tramways Company, for disregarding schedule time, and the men demanded his reinstatement, threatening to strike if their demand was refused. At first, the manager declined to yield to the men's demands, but after prolonged negotiation, in which local miners' leaders took an active part, the driver was allowed to return to work, and the strike was averted.

MISCELLANEOUS NEWS AND NOTES.

Shortage of Coal in Paris.—Owing to the shortage of coal the Parisian public have been warned that the underground electric trains may have to be run at a lower speed.

Cost of Power Increased.—Bradford Tramways Committee have agreed to pay to Bingley County Council for electricity supplied for the tramways in the Bingley area, as from March, 1919, last, 2.009d. per Board of Trade unit. The price previously paid was 1.482d.

Tramway Deputation to Transport Minister.—Sir Eric Geddes has been asked to receive a deputation representing seventy-two tramway companies, who will urge an amendment of existing Acts so as to permit companies to increase fares by 50 per cent.

Railway Rates Revision.—The Minister of Transport has appointed a Rates Advisory Committee. Mr. F. Gore-Browne, K.C., is chairman and Mr. W. M. Acworth is an additional member, to deal with the question of an immediate increase of rates.

Cost of the Eight-Hour Day on the Underground.—The adoption of the eight-hour day by the omnibus services and the tramways and railways operated by the Underground group of companies will entail an additional expenditure of £700,000 per annum, and approximately 20 per cent. more staff are required to work the services.

Revision of Liverpool Fares.—Mr. E. Russell Taylor, chairman of the Liverpool Tramways Committee, has stated that the revision of the whole of the fares and stages has been completed. Realising that anomalies must creep in, a sub-committee had been appointed to go into the matter again.

Dundee Rate for Energy Prohibitive.—The Dundee, Broughty Ferry and District Tramways Company has given notice to terminate its arrangement with the Corporation electricity department on the ground that the proposed rate for energy, viz. : 1.75d., plus 10 per cent., is prohibitive.

Purchase of Ashton-under-Lyne Tramways.—Proceedings in the arbitration for the purchase by the Ashton Corporation and neighbouring authorities of the undertaking of the Oldham, Ashton and Hyde Electric Tramways, Ltd., are to be commenced in London shortly.

No Lifeguard.—An emergency tramcar belonging to Cardiff Corporation, running without a lifeguard, knocked down a man at Treforest and killed him. At the inquest the jury expressed the opinion that, while the driver was to be exonerated from all blame, a lifeguard on the tramcar might have saved the man's life.

Proposed Essex Light Railway.—The Light Railway Commissioners have held an enquiry at Ongar, in regard to the proposals to construct a light railway between Ongar and Sherfield, joining up with the Great Eastern Railway, and bringing the Roothings of Essex into touch with Chelmsford and the coast, besides providing an alternative route to London.

No Service on Christmas Day.—Oldham Corporation Tramways Committee have decided to suspend the service on Christmas Day and to grant £75 toward the expense of a welcome home to ex-service men in the department to be held on that day. No less than 370 men enlisted and of these 191 have returned. In addition 100 other returned soldiers are now employed.

Queue System at Leicester.—The queue system, which has just been introduced at Leicester, was put to a severe test on a recent Saturday afternoon, when great crowds lined up for conveyance to the football grounds. The success of the experiment is described as complete and it is expected to lead to the provision of queues at other spots.

Manchester Electricity Works Extension.—On Tuesday the Minister of Health held an inquiry into the application of the Manchester City Council to borrow over a million pounds for the extension of the electricity works. The works must be ready in less than three years to cope with the new applications of electricity for industrial purposes.

The Institution of Electrical Engineers.—The opening meeting of the session 1919-20 will take place at the Institution of Civil Engineers, Great George Street, Westminster, on Thursday, November 13, at 6 p.m., when the president, Mr. Robert T. Smith, will deliver his inaugural address. As in the past, light refreshments will be served at 5.30 p.m.

Fogmen for London Omnibus Services.—The London General Omnibus Company have arranged to place on the London streets a specially trained staff of fogmen, who will be on duty in time of fog both day and night. A commencement is to be made at thirty-four of the busiest traffic points. These fogmen will be equipped with lamps to signal and guide the omnibuses at the busiest traffic centres.

Issuing Used Tickets.—At Mansfield Borough Court, a former conductor of Mansfield and District Tramways Company, was charged with stealing four 2d. fares. The allegation of the prosecution was that the defendant had issued to passengers tickets which had previously been used. After proof had been led, the ex-conductor was convicted and fined £5, the magistrate remarking that the penalty was very light considering the serious nature of the offence.

Nottingham Tramway Extensions.—The proposals of the Tramways Committee for obtaining powers to extend the Corporation tramways to Beeston, Bucknall and Bulwell were approved by the City Council at a meeting on October 20. Mr. R. H. Swain, chairman of the Tramways Committee, said that had it not been for the war the Beeston extension would by this time have been completed. The powers had now expired and it was thought that powers to construct the lines should again be sought.

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Accidents in London Streets.—In the last ten years over 4,000 men and women have been killed and over 100,000 injured in the London streets. A representative of the *Globe*, after investigation, finds that nearly 40 per cent. of the victims of accidents are children. Eighty per cent. of the accidents due to motor omnibuses occurred when the speed was about five miles per hour, and about twenty-five per cent. of the fatal accidents attributed to the omnibuses were caused through skidding cyclists.

Paris Ruffians Attack a Conductor.—Crimes by apaches in Paris are on the increase. The latest incident was an attack on a tramway car at Aubervilliers. Fifteen ruffians boarded the car and attempted to snatch the money bag from the conductor. He, however, had a revolver and promptly fired on his assailants, who returned the fire, but disappeared on the approach of cyclist policemen. Fortunately neither the conductor nor any of his passengers were wounded, but a young man in the street was shot through the lungs and was fatally injured.

The Efforts of the Underground.—The following notice has been posted in the cars of the District and the Tube railways :—" To our passengers. We know and much regret that the present service is unsatisfactory. Every available car is being used. We have ordered 200 new cars. The manufacturers are hurrying on with them. Meanwhile we are doing our very best to carry on. It is uphill work. We had your good will in the past. We are working just as hard to deserve it to-day. We ask you to be patient until we can get things straight. A. H. STANLEY, Chairman."

Morecambe Tramways. At a meeting of the Morecambe Town Council, Alderman Hall urged that it was time to adopt a better system than horse traction. The motor omnibuses with which they augmented the service had not impressed him favourably, as they did not carry a sufficient number of passengers. Alderman Brown, in reply, said that with only two motor omnibuses they could not well extend the service to other parts of the town, but the company hoped to obtain more satisfactory results with the omnibuses when they had had them a little longer.

Edinburgh Contract for Turbo-Alternators.—The Edinburgh Town Council have approved the tender of Brown, Boveri and Company, Ltd., of Baden, Switzerland, for turbo-alternators for Portobello power station, amounting to £106,518. The nearest British tender was £70,000 higher. In proposing the acceptance of the tender, Mr. Bruce Lindsay said that two of the British firms had stated that they were unable to make any reduction in the tender, and the third intimated that they could not reduce their price more than 10 per cent. One of the contractors stated that assuming the work were done without any profit they could not approach the foreign offer.

Proposed Institute of Transport.—Sir Albert Stanley, M.P., has issued invitations for luncheon on Monday, at the Savoy Hotel, at which a proposal to establish an Institute of Transport will be discussed. A resolution will be submitted stating that it is desirable that an institute be formed for the scientific study of questions relating to traffic and transport and suggesting that those present should constitute themselves as a provisional council. A further resolution provides that a temporary executive committee should be formed to take the necessary steps to secure registration and incorporation of the institute. It is proposed that Sir Eric Geddes, Minister of Transport, be invited to become the first president.

Campaign Against Cheap Transit.—The usual opposition to cheap transit in the form of new tramways in London has already begun. The *Times* led off on Monday with the unthinking parrot cry that tramways are a "survival," that in the railway strike drivers of lorries found them a nuisance, and that while a tramcar now costs approximately £2,500, a motor omnibus can be obtained for £000. The fact that there is no possibility of finding any means for carrying passengers so cheaply as by tramway is not mentioned. What is essential in these days is that the public should be carried at the lowest possible cost, and although traffic may at points appear to be congested by the tramways, if the same number of passengers as are carried by tramcars had to be transported by motor omnibuses the traffic would be immeasurably more congested.

Fatal Tramway Accident at Nottingham.—An accident occurred at Nottingham on October 25, involving the death of one passenger and injuries to two others. A car ascending an incline stopped and then ran backward despite the efforts of the driver. Several passengers becoming alarmed, jumped off, and one woman has since died in hospital from her injuries. Another woman similarly injured is progressing favourably. Neither would have been hurt had they kept their seats as the car was stopped without any accident. A postman named Wyatt pluckily jumped on the car while it was running down hill and attempted to apply the back brake. The car came to a standstill at the bottom of the incline. It was then run to the depot where the brakes, were found to be in working order.

Newcastle Corporation Tramway Extension.—In the Bill which the Newcastle Corporation propose to submit to Parliament in the ensuing session a number of tramway extensions are included. Power is to be sought to link up the tramways of Newcastle and Gateshead Corporations by a double line across the high level bridge which is owned by the North Eastern Railway Company, to lay a double line along Percy Street, and other extensions. The omnibus service scheme is to be extended to a number of outlying towns. Powers will also be sought for the acquisition of the undertaking of the Tyneside Tramways and Tramroads Company. It is not proposed to seek compulsory powers to do this and the arrangement will be concluded only after negotiation between the Corporation and the company.

Fine for Assaulting a Woman Conductor.—For striking a woman tramway conductor, James Chambers, of Greasly, a miner, was fined £2 at Nottingham on October 25. Mr. R. A. Young, who prosecuted for the Nottinghamshire and Derbyshire Tramways Company, said that the conductress asked the defendant for an excess fare. He refused, and when the conductress attempted to prevent him from alighting he seized her by the throat and struck her in the face.

Increased Wages at Glasgow.—Glasgow Corporation Tramways Committee recommend that the Corporation should approve generally of a settlement of the tramway men's demands, in accordance with which war bonuses or war wages will be increased by 6s. a week in the case of men over 18 years of age and 3s. to those under that age, the award of 4s. and 2s. respectively, issued by the Interim Court of Arbitration on October 7 to be merged in these advances. Women conductors and car cleaners will receive an additional bonus of 3s. per week.

Presentation to Leeds Women Conductors.—On October 27, some sixty conductresses, who have served on the Leeds tramways for three years or more, received from the management a token of their services in the form of a brooch of silver and enamel with the Leeds coat-of-arms in the centre. These were handed to the women at an informal gathering at the tramway offices. In the absence of the chairman, Alderman R. A. Smithson, through illness, Mr. J. Stringer Hinchcliffe, chairman of the Traffic Sub-Committee, presided. Among others present were Mr. J. B. Hamilton, general manager, and Mr. A. Daggett, traffic superintendent. Mr. Hinchcliffe paid a tribute to the women's services, pointing out that they took up the work at a very trying time, and describing the difficulties they had surmounted. Mr. Hamilton said that in Leeds the employment of women had been undertaken with a good deal of hesitation, but in practice they had found the women as sharp as any conductors they had. He found, too that the health of the women had improved through the open air life.

CONTRACTS AND ORDERS.

Additional Cars for Southend-on-Sea.—The Southend Corporation proposes to purchase additional tramway cars, and is extending the existing contract with the Brush Electrical Engineering Company who are to supply five double-deck cars in addition to the seven already ordered. A new car shed is to be erected subject to sanction being obtained for the necessary loan.

New Cars for Leicester.—The Board of Trade has sanctioned the borrowing of £27,000 by Leicester Corporation for the purchase of a number of cars. The Tramways Committee have decided that eighteen new cars are needed. They propose to build six in the Corporation shops, for which the trucks and equipment will be purchased. The total cost of the eighteen fully equipped canopy-top cars is estimated at £37,566, and the Committee propose that the amount of the necessary additional equipment (£10,566), shall be borrowed on the balance of the tramway revenue for the current year or from the reserve fund. The tender of the English Electric Company, Ltd., for twelve cars at £2,078 each has been accepted, and also for six sets of trucks and electrical equipment at £805 per set for the cars to be built in the Corporation workshops.

PERSONAL.

Mr. C. Hobson, charge engineer of Woolwich Council electricity works, has accepted a position with the London and South Western Railway Company.

Mr. W. R. Cooper has relinquished his position as editor of the *Electrician* and will continue his consulting practice as hitherto at 82, Victoria Street, London, S.W.

Mr. R. O. Baldwin, manager of Exeter Corporation tramways, has been granted an increase in salary to £400 per annum, and a further addition of £50 at the expiration of twelve months.

Mr. D. Hazel has been appointed a member of the Highways Committee of the London County Council, to fill the place of Captain A. O. Goodrich, who has resigned.

Mr. A. A. McKinstry, general manager in Australia of the Metropolitan-Vickers Electrical Company, has resigned his position as one of the Victoria Government Electricity Commissioners. He will come to England on business connected with the company.

Mr. E. S. Rayner, electrical engineer and tramways manager of Doncaster, has been presented by the staff with an eight-day striking clock, and by the chief officials of the Corporation with a silver fruit bakset, on leaving to take up the position of electical engineer and tramways manager at Hull.

Mr. Kennedy Jones, on the invitation of the Prime Minister and the Minister of Transport, has accepted the chairmanship of the Advisory Committee on London Traffic, which the Minister of Transport has appointed. The names of other members will be announced later.

Mr. H. G. Jeken, engineering assistant to the Leeds City tramways, has been appointed manager of the Middlesbrough Corporation tramways, at a salary of £750 a year. Mr. Jeken has been connected with the Leeds tramways since the commencement of the electric service in August, 1897. During 1917-18 he was lent by the Corporation to the Admiralty, and was subsequently appointed assistant director of the Admiralty labour department at Hull.

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FINANCIAL.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended October 29 amounted to £76,069, an increase of £12,829 as compared with the corresponding period last year. The route mileage was 141.67, the same as a year ago. From April 1 (the commencement of the financial year) to October 29 (thirty weeks and two days) the total receipts were £2,461,836, an increase of £481,230 on the corresponding period of 1918.

Norwich Electric Tramway Co.—The directors of the Norwich Electric Tramways Company announce a dividend of 2 per cent. (4s. per share), less income-tax, for year, payable 8th November; £1,000 to writing down cost of turbo-generator; £547 to writing off balance of the cost of 1914 Act; £4,000 to reserve; £5,000 as provision for reconstruction and deferred repairs; £167 forward. Last year, dividend same; £7,000 to reserve; £2,000 to deferred repairs account; £1,000 written off cost of 1914 Act; £1,000 to writing down cost of turbo-generator; £117 forward.

Manchester Corporation Tramways.—Mr. J. M. McElroy, general manager of the Manchester Corporation tramways, has presented a statement of results for the half-year ended September 30, 1919. It will be seen from the summary below that the estimated surplus, excluding provision for renewals, is £124,328.

	£	Pence per car mile.
Traffic revenue	790,795	20.189
Other revenue (rent of lines, etc.)	4,700	.118
Motor buses (net revenue)	1,234	.031
Parcels (net revenue)	770	.019
Total revenue	£806,499	20.307
Traffic expenses	322,355	8.117
General expenses	62,115	1.564
Repairs and maintenance	109,932	2.768
Power expenses	86,419	2.176
Operation expenses	£580,821	14.625
War service allowances	4,775	.120
Interest, sinking fund, &c.	96,575	2.432
Total expenditure	£682,171	17.177
Surplus (excluding provision for renewals)	124,328	3.130
Surplus for corresponding period last year	127.941	3.278
Car Mileage		9,531,447
Corresponding period last year		9,366,129
Passengers carried		141,884,761
Corresponding period last year		128,448,547

The estimates prepared in April for the year ending March 31, 1920, showed an anticipated surplus for the year, excluding provision for renewals, of £201,890, but the general manager points out that owing to increased war bonus to employees it is doubtful whether this surplus will be realised. The cost of the additional wages granted to employees under the recent award amounts to about £20,000 for the half year. For the half year ended September the cost of renewals was £71,543, and probably double that sum will be expended in the whole year. The renewals fund at the end of March amounted to £446,479. It will be necessary for the Tramways Committee presently to review the financial position of the department, in view of the great increase in wages amounting to £475,000 per annum, and the increased cost of materials.

EXETER CORPORATION TRAMWAYS.

Ticket Inspector and General Clerk.

The Exeter City Council invite applications for the post of Ticket and General Traffic Clerk in their Tramway Department. Preference will be given to one with previous tramway experience. Salary £140 per annum. Applications endorsed "Tramway Clerk," stating age and experience, to be forwarded to me by Thursday, 13th November next.

H. LLOYD PARRY,
Town Clerk.

Engineering Estimating Clerk.

Engineering Estimating Clerk wanted, having experience in Cost Keeping, pertaining to Light Constructional work, for electrical overhead transmission.

Apply Box No. 29, THE TRAMWAY AND RAILWY WORLD, Amberley House, Norfolk Street, London, W.C.,2, stating qualifications and salary expected.

LONDON AND DISTRICT CONTRACTS.

London and District Contracts.—Gentleman, reopening business is willing to represent good firm. Advertiser is in a position to obtain substantial orders.—Address Box No. 28, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

SIGNALLING SYSTEMS FOR STREET TRAFFIC.

The proprietor of British Patent No. 24392 of 1914, relating to "Signalling Systems for controlling street traffic," desires to enter into negotiations with one or more firms in Great Britain for the sale of the patent rights or for the grant of licences to manufacture under royalty.

Enquiries to be addressed to D. YOUNG & Co., Patent Agents, 11 & 12, Southampton Buildings, London, W.C.2.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	Oct. 22	455	536	+ 41	29	16,039	+ 1,353
Aberdeen Corporation	,, 22	2,303	3,030	+ 7:6	2 0	71,135	+ 15,378
Ayr Corporation	,, 25	382	501	+ 119	23	21,023	+ 3,697
Belfast City	,, 24	8,763	10.605	+ 1 842	30	310,446	+ 67,843
Birkenhead Corporation	,, 26	2,099	2,962	+ 863	29½	87,692	+ 20 926
Birmingham Corporation	,, 18	24,661	25,486	+ 825	29	745'247	+ 63,368
do. Motor Buses	,, 18	1,400	1,597	+ 197	29	51,062	+ 7,069
Blackburn Corporation	,, 22	1,931	2,197	+ 266	30½	72,324	+ 16,117
Bradford Corporation	,, 25	9,438	11,166	+ 1,728	30	346,587	+ 66,229
Burnley Corporation	,, 25	2,670	3,033	+ 363	..	..	..
Burton-on-Trent Cor.	,, 28	366	499	+ 133	30	1,5167	+ 2,736
Bury Corporation	,, 26	2,109	2,212	+ 103	30½	73,237	+ 20 318
Chatham & District	,, 16	1,301	1,455	+ 154	41	63,306	+ 8,754
Cork Electric	,, 16	564	766	+ 202	41	28,924	+ 2 851
Derby Corporation	,, 25	1,486	1,924	+ 442	30	58,569	+ 12,817
Dundee City	,, 22	1,873	2,452	+ 579	22½	59,539	+ 14,450
East Ham Corporation	,, 25	1,486	1,842	+ 356	29½	58,274	+ 11,816
Edinburgh	,, 18	8,577	10,181	+ 1.604	15½	183,498	+ 35 885
Glasgow Corporation	,, 25	28,434	33 281	+ 4,847	21	684,142	+ 79,686
Glossop (U.E. Sup. Co.)	,, 25	171	221	+ 50	43	9,652	+ 1,875
Huddersfield Corporation	,, 25	3,666	4,801	+ 1,135	30	148,653	+ 32,606
Ilford U.D. Council	,, 25	882	1,145	+ 263	29½	36.480	+ 6,210
Ipswich Corporation	,, 25	616	871	+ 255	30	28,985	+ 5,009
Isle of Thanet	,, 22	306	687	+ 381	3½	2,961	+ 1,177
Kilmarnock Corporation	,, 25	259	278	+ 19	23½	6,778	+ 743
Lanarkshire	,, 16	3,666	3.860	+ 194	41	152,506	+ 3,183
Leeds City	,, 25	13,617	16,002	+ 2,385	30	502,482	+ 100.177
Leicester Corporation	,, 25	4,214	6,023	+ 1,809	..	..	..
Leyton U.D Council	,, 23	2,209	2,362	+ 653	30	95,721	+ 25,998
Liverpool Corporation	,, 25	18.751	24,471	+ 5.720	42½	948,556	+ 173,677
London County Council	,, 29	63 240	76,069	+ 12,829	30½	2,461,836	+ 481,230
Maidstone Corporation	,, 63	2 7	382	+ 145	29½	11,971	+ 326 5
Manchester Corporation	,, 25	27,291	30,383	+ 3 092	30	918,544	+ 142,070
Newcastle-on-Tyne Cor.	,, 25	9,522	10,435	+ 913	29	287,672	+ 13,307
Northampton Cor.	,, 24	782	1,247	+ 465	30	38,213	+ 12,321
Nottingham Corporation	,, 23	5,700	7,271	+ 1 571	30	215,023	+ 41,135
Oldham Corporation	,, 26	3,489	4,363	+ 874	31	128,915	+ 29,713
Reading Corporation	,, 23	1,223	1,487	+ 264	30½	47,975	+ 8,30 1
Rotherham Corporation	,, 22	2,508	2,086	— 422	29½	62,302	— 7,104
Sheffield Corporation	,, 26	13,097	16,414	+ 3,317	30½	504,222	+ 88,798
Southampton Cor.	,, 22	2,358	2,465	+ 107	29½	81.210	+ 4,533
,, Motor Buses	,, 22	..	189	..	12	1,437	..
Southend-on-Sea Cor.	Sept. 24	1,473	2,312	+ 849	27	64 106	+ 26.555
South Shields Cor.	Oct. 18	1,121	1,392	+ 270	29	41.690	+ 7.683
St. Helens Corporation	,, 21	..	1,633	..	3	5,216	..
Sunderland Corporation	,, 26	2,279	2,689	+ 410	30	87,832	+ 13.545
Torquay Tramways	Aug. 14	1,700	2,019	+ 319	32	34,385	+ 6,037
Tyneside Trys. & Trmrds.	Oct. 8	940	1,791	+ 851	15	19,280	+ 2,865
Wallasey Corporation	,, 25	1,554	2,336	+ 782	29½	78,949	+ 20,840
Walsall Corporation	,, 25	1,255	1,615	+ 360	30	43,958	+ 6,708
Walthamstow U.D. Coun.	,, 25	1,242	1,500	+ 258	30	53,101	+ 8,977
Warrington Corporation	Sept. 25	809	924	115	25	22 663	+ 3,426
West Ham Corporation	Oct. 23	4,232	5,066	+ 834	29½	161.722	+ 26,750
Wolverhampton	,, 29	1,751	1 860	+ 109	30	61,381	+ 8,807

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Wks.	Aggregate. 1918-19	Increase or Dec.
Anglo-Argentine	Oct. 28	£48,534	£35,630	43	£2,494,961	+ £100,136
Ballarat and Bendigo (4 wks)	Aug. 17	2,996	2,192	20	15,991	— 410
Brazilian Traction (Mlrs.)	Aug	9,491,000	9,734,000	34	73,767,000	+ 5,118,000
Brisbane	Sept.	35,400	41.970	38	346.370	+ 20,516
British Columbia $	Aug.	544,339	667,170	9	1,309,260	+ 350,953
Buenos Aires Lacroze	Sept.	40,006	45,310	13	137,378	+ 13,410
Burmah Tram. & Light Rs.	Sept.	30,836	43,152	8	86,835	+ 14,144
Calcutta Rs.	Oct. 18	74,602	82,658	41½	..	+ 459,837
Carthagena and Herrerias	Sept.	2,549	1,539	35	25,504	— 12,897
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	Sept.	1,939	2,831	8	5,592	+ 1,678
Hong Kong $	Sept. 6	15,599	15,480	36	529,466	+ 36,106
Kalgoorlie	June	2,747	2,646	26	15,842	— 113
La Plata	Sept.	4,999	5,540	39	51,043	+ 4,728
Lima	July	45,964	40,025	30	331,932	+ 29,742
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Oct. 18	39,924	47,890	40	791,902	+ 70,602
Manila $	June	183,250	160,670	26	1,207,412	+ 170,313
Montevideo	Sept.	29,611	26,552	47	404,201	+ 57,428
Para	Sept.	23,442	24,386	43	246,012	+ 3,964
Pernambuco	Oct. 26	3,524	6,059	42½	223,528	+ 27,138
Peruvian $	July	987,300	1,058,780	..	..	..
Rangoon	Sept.	6,067	6,812	39	58,472	+ 2,892
Shanghai (2 weeks) $	Apr 23	50,760	56,755	16	447,279	+ 53,577
Singapore $	Sept. 6	14,847	15,522	36	549,443	+ 52,451
Toronto $	Aug.	1,070,567	1,083,741	34	8,194,299	— 282,373
Winnipeg $	Aug.	288,974	353,194	34	2,565,812	+ 177,345

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(DICK, KERR SYSTEM.)

THE
ENGLISH ELECTRIC COMPANY LIMITED,
Queen's House, Kingsway,
LONDON, W.C.2.

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THE
Tramway and Railway World

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SATURDAY, NOVEMBER 8, 1919.

THE INSTITUTE OF TRANSPORT.

On November 3rd an Institute of Transport was formed for the scientific study of questions relating to the various forms of traffic and transport and for the promotion of the industry in its various branches. On the invitation of the Right Hon. Sir Albert Stanley, M.P., a number of guests met at luncheon at the Savoy Hotel and subsequently agreed with unanimity to appoint a committee to make all necessary arrangements for the formation of the first Council of the Institute and to take other steps necessary to carry out the decision of the meeting. It is many years since the idea of an institution to combine all transport interests was first suggested, but the establishment of the Ministry of Transport has strengthened the feeling of unity among all branches of the industry and has added force to all the arguments in favour of the organisation of a body that can adequately represent the important interests subserved by those engaged in transport. Although the precise character of the work to be done by the Institute will only be determined after further consideration, it will, of course, differ widely from that of such professional bodies as the Institution of Civil Engineers. Those societies are mainly concerned with the status of their members; the Institute of Transport will not only make a wider appeal for membership, but will concern itself with matters of public interest, and it will, no doubt, endeavour to assist the Government in dealing with important problems in relation to transport that will confront it within the near future. There will be much criticism of the new Institute and its objects; but it is of good augury that the meeting on Tuesday, which consisted of representatives of all interests in transport, gave unqualified endorsement to the interesting and practical address of Sir Albert Stanley in moving the appointment of the preliminary committee. The time has now passed when the industry was so divided by numerous lines of cleavage that it was impracticable to secure any unity of action. To-day all interests are under the care of one Ministry; and nothing but good can result from the recognition of the fact that everyone engaged in the industry must take a wider outlook than in the past. There will be greater opportunities for the personnel; there will be more important positions to be filled; and adequate provision will be necessary for training men to fill these positions. With the influential support of which the Institute is assured, there can be no question of its success, and we are confident that before many months have elapsed it will be firmly established and that its influence will become a factor of increasing importance in the progress of transport in this country.

INCREASE IN FARES.

At a meeting of the Hastings Town Council it was reported that although negotiations had been proceeding between the Council and the Hastings Tramways Company, the latter had obtained from the Ministry of Transport an order for an increase of fares, under which 2d. would be charged for any distance exceeding half a mile. The increased fares would come into operation on November 10th, but the town clerk explained that in the event of the fares being insisted upon, he had been instructed to apply for an injunction. Members of the Council expressed dissatisfaction that the Tramways Company had gone to the Ministry of Transport without consultation with the Corporation.

In his half-yearly report, Mr. J. M. McElroy, general manager of the Manchester Corporation tramways, indicates that increased fares may be necessary. On or before the close of the present year he says the Committee must review the financial position and determine the future policy, in view of the increase in expenditure due to the payment of the large sum (amounting to £475,000 per annum) paid to the employees for war bonus, and the increased cost of material.

Chesterfield Corporation propose to advance their fares as from November 1st. Extensive track repairs are being carried out and additional revenue is necessary to meet this outlay and the increased wages bill.

WITHDRAWAL OF NATIONAL STEAM CARS.

The directors of the National Steam Car Company after careful consideration propose to withdraw their omnibuses from service in London, as they cannot be continued without incurring heavy loss. Although the earnings per omnibus mile have been well maintained, the expenses have so much increased that the service would be unprofitable. Four main causes for the discontinuance are given as—the high cost of fuel, recent increase of wages combined with reduction of working hours, reduction of mileage owing to congestion of traffic, and inadequate fares.

To avoid public inconvenience the company has co-operated with the London General Omnibus Company, who will replace the services as far as possible, and two garages have been sold to that company. From the experience already gained in the provinces, the Steam Car Company considers its future will be considerably strengthened by discontinuing its business in London, particularly as it has now ample resources to introduce new provincial services and to extend those that are already profitable.

"UNDERGROUND" EFFICIENCY MEETINGS

The first of the fifth series of Efficiency Meetings of the London Underground Railways and the London General Omnibus Co. was held on the 28th October, 1919, at the Omnibus Training School, Chelsea, when Mr. H. E. Blain, Operating Manager, presided over an attendance of some 300 members of the administration and control staffs of the associated undertakings.

The paper for the evening—"Railway and Omnibus Camera Studies," read by Capt. A. Rozier, General Superintendent, L.G.O.C., was exceedingly interesting, and was composed of descriptions of the places and objects of interest on several of the omnibus country routes, illustrated by cinematograph films and lantern slides. Special films were shown of the manufacture of electric locomotives as carried out by the General Electric Company of Schenectady, U.S.A., preceded by illustrations of various forms of traction, both past and present. A trip over the "Bakerloo" extension from Queen's Park to Watford was illustrated, as also were some "Dont's" for the omnibus staff and the farewell meeting and parade of the L.G.C.O. Special Constabulary on Empire Day, May 24th, 1919.

A vote of thanks to the reader was moved by Mr. J.S. Bradford assistant superintendent (southern division) London and North Western Railway, seconded by Mr. W. M. Ballinghall, accountant to the Metropolitan Railway.

At the November meeting four short papers will be read:—"Problems of my Official Life," by an inspector attached to the Claims Department, a mess-room steward (Railways), divisional inspector (omnibus), and depot inspector (Railways).

Effect of Antiquated Tramways Act. Sunderland Corporation Tramways Committee has decided to abandon the inner loop-line scheme through John Street, one-third of the frontagers in that street having decided on opposition to the proposal under the Tramways Act, 1870. The Committee could not, therefore, hope to succeed in procuring sanction for the construction of the new line.

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GREAT TRAMWAY SCHEME APPROVED FOR LONDON.

At the meeting of the London County Council on Tuesday recommendations of the Highways Committee involving the construction of 38 miles, 5 furlongs of tramway track, at an aggregate cost of £4,205,345 were adopted. As shown in the appended table,

Description of tramway.	Single line of track.	System of traction	Estimated cost of construction and equipment.	Total cost of property and works	Total cost.
	M. F. CH.		£	£	£
(i.) Charles-street to Blackfriars-bridge	1 3 3	Conduit	124,665	—	124,665
(ii.) Gray's-inn-road to Farringdon-road ..	— 5 6	"	74,700	1,050	75,750
(iii.) Hampstead-road to a point north of the National Gallery ..	2 2 2	"	100,170	—	100,170
(iv.) Cambridge-circus to Theobald's-road ..	1 1 4	"	97,965	12,500	110,465
(v.) Victoria (Vauxhall-bridge-road tramway terminus) to Westminster-bridge	1 7 8	"	248,060	—	248,660
(vi.) Victoria (Vauxhall bridge-road tramway terminus) to Marble Arch ..	3 3 0	"	277,310	—	277,310
(vii.) Marble Arch to Cricklewood .	7 5 6	Conduit and overhead	494,330	356,000	850,330
(viii.) Edgware-road to King's-cross ..	4 2 6	Conduit	380,300	293,000	673,300
(ix.) Shepherd's-bush to Marble-arch ..	5 1 4	Conduit and overhead	393,880	—	393,880
(x.) Seven-sisters-road to Stamford-hill, via Amhurst-park ..	1 2 5	Conduit and overhead	87,025	—	87,025
(xi.) Aldgate terminus to Aldgate station, via Aldgate High-street	— 1 6.2	Conduit	28,550	—	28,550
(xii.) Aldgate to Tower-hill	— 6 0	"	55,955	—	55,955
(xiii.) Tooley-street tramway terminus to Hop Exchange	— 4 6	"	38,740	—	38,740
(xiv.) Waterloo-road to Blackfriars-road, via New-cut	— 4 4	"	45,770	—	45,770
*(xv.) High-street, Wandsworth, to Roehampton-lane	4 2 1	Conduit and overhead	164,220	192,000	357 220
(xvi.) Forest-hill to Crystal Palace	3 1 6	Conduit and overhead	149,785	59,500	209,285
(xvii.) West Norwood to Crystal Palace ..	3 7 8	Overhead	179,670	13,500	193,170
Spare cars (which cannot be allocated to any particular route	—	—	—	—	108 100
High tension cables (which cannot be allocated to any particular route) ..	—	—	—	—	137,000
Total	42 7 5.2		3,031,695	928,550	4,205,345

*This line has been excluded from the scheme.

the plans comprise 17 lines, and all but one of these, viz., the line from High Street, Wandsworth, to Roehampton Lane, were approved. A bill will accordingly be promoted by the Council in the next session to obtain Parliamentary powers to carry out the work. In addition it is proposed that at a later date powers would be sought for the construction of 47 additional miles of track, at a cost of £4,000,000.

A long preliminary discussion took place on the scheme as a whole, which is estimated to cost a total sum of £8,000,000 when completed. Several good speeches were made on London traffic problems, the main points of the controversy being the inopportuneness of embarking on so large a scheme at the present moment, when prices rule so high, the respective merits of the tram-car and the self-contained vehicle, the uncertainty of the future of road traction and the varying conditions of passenger traffic in Greater London.

MR. W. J. SQUIRES, in a general statement, defended the proposals, pointing out that the Council had been inert for seven years in regard to tramway developments and that they must now overtake arrears. He asked them to consider the scheme as a whole without prejudice. The large sum involved was a stumbling block to many, but the scheme had been adopted by the Committee almost unanimously. Before the war its cost would be less than half what it would be to-day.

MAJOR I. SALMON contended that the Council were not now justified in embarking on so large a scheme, but he agreed with the proposals to link up. It was not a commercial proposition to undertake the proposed extensions. The Council would soon have power to run motor buses and this would materially affect the tramways and the whole position; possibly the buses would be detrimental to the tramways.

MR. H. H. GORDON criticised the speeches of those members who seemed to desire to follow a policy of masterly inactivity. There were good grounds for saying the scheme was absolutely necessary. Fares had been raised to the limit and action was needed to increase the revenue of the undertaking by making it more efficient and publicly useful. They must follow a policy of wide development, and he contended that only rail traction could cope with the rush traffic of London, which was the special feature they had to provide for and deal with.

MR. G. H. HUME urged that so long as the working population had to be taken to and from the centre of London, fixed rail traction was indispensable, and he thought it was the duty of the Council, even to-day, to go to Parliament with a substantial scheme of extensions.

The REV. DR. SCOTT LIDGETT supported the scheme, which the Progressive party considered to be an urgent reform from the housing aspect. Housing schemes were useless without means of conveyance to and from the central district.

The report was then received *nem. con.* and the various schemes were considered seriatum. Motions to omit a number were made and defeated; in the end all the schemes were adopted except No. xv, which was omitted on a division by 51 to 50.

THE INSTITUTE OF TRANSPORT.

THE RT. HON. SIR A. H. STANLEY, M.P., IN THE CHAIR.

The following guests were present at the invitation of Sir Albert Stanley, M.P. at the luncheon at the Savoy Hotel on November 3, when the Institute of Transport was formed:—

MINISTRY OF TRANSPORT.

Sir John Aspinall, Sir Chas. Bartolomé, Sir Geo. Beharrell, Sir Francis Dunnell, Sir Alexander Gibb, Sir Phillip Nash, Sir Wm. Marwood, Sir Henry Maybury

RAILWAYS.

C. Aldington (G.W.R.), W. M. Acworth, H. E. Blain (Underground), Sir Sam Fay (G.C.R.), L. W. Horne (L. & N.W.R.), R. H. Selbie (Met. Rly.), Sir Herbert Walker (L. & S.W.R.), Sir I. T. Williams (L. & N.W.R.)

TRAMWAYS.

(A) Municipal: Sir J. Courtis (Cardiff), A. R. Fearnley (Sheffield), A. L. C. Fell (L.C.C.), H. H. Gordon (L.C.C.), T. B. Goodyer (Croydon), J. M. McElroy (Manchester).

(B) Company:—The Hon. Sir Arthur Stanley, G.B.E., J. Devonshire (London and Suburban), E. H. Edwardes (Sth. Lancashire), H. England (Wakefield), R. J. Howley (B.E.F.).

ROAD BOARD:—Sir George Gibb. INLAND WATERWAYS: Sir Maurice Fitzmaurice. PORT OF LONDON AUTHORITY: Sir J. Broodbank.

MOTOR, ETC., PASSENGER AND GOODS TRANSPORT.

Mr. H. Dutfield, Sir W. Joynson-Hicks, Bart., M.P., S. E. Garcke, E. S. Shrapnell-Smith, H. C. B. Underdown, W. Wolsey, Junr.

OTHER INTERESTS: Sir Evan Jones, M.P., Sir Lynden Macassey, R. Birton Chadwick, M.P., Col. T. H. Minshall, F. C. Colman, W. E. Frier, J. A. Kay, A. M. Willcox, Chas. Travis.

Apologies regretting inability to attend had been received from:—A. Baker (Birmingham Tramways), Sir A. Kaye Butterworth (N.E.R.), Sir Francis Dent (S.E. & C.R., on the Continent), C. H. Dent (G.N.R.), J. Dalrymple (Glasgow Tramways), Sir Wm. Forbes (L.B. & S.C.R.), J. B. Hamilton (Leeds Tramways), who wrote:—"I am very strongly in sympathy with the general idea of such an Institute, and I am also strongly in agreement with the resolutions which are proposed to be put before the Executive Committee, and the Articles and Memorandum of Association"; C. H. Merz, A. Tatlow (Mid. R.), who wrote that he would not be in London, but "shall, however, be pleased to become a member of the Institute in the event of it being formed, and would like to know the result of the Meeting"; Sir Hy. Thornton (G.E.R., out of Town); A. Watson (L. & Y.R.), not in London, wrote, "is entirely in sympathy because he considers that an Institute of this character is needed. He would be glad to become a member if the Institution is formed"; H. A. Watson (N.E.R.) "is thoroughly in sympathy with the movement." Mr. J. Dalrymple (Glasgow) telegraphed his regret that he would not be in town.

PROVISIONAL COMMITTEE.

The provisional committee of ten members was appointed consisting of the following:—Two members of the Ministry of Transport, Sir Sam Fay, Sir Francis Dent, Mr. H. H. Gordon, Sir Maurice Fitzmaurice, Sir Joseph Broodbank, Sir W. Joynson-Hicks, M.P., and Mr. H. Dutfield, with Sir Albert Stanley, M.P., as chairman.

LONDON TRAFFIC ADVISORY COMMITTEE.

The following announcement was officially issued on November 5th:

The Minister of Transport has appointed an Advisory Committee to advise him and to assist the Ministry in dealing with those matters connected with London traffic which come within its province. Mr. Kennedy Jones, M.P. has accepted the Chairmanship of the Committee, which is being constituted as follows:—

Mr. Will Thorne, M.P.; Sir Charles de Bartolomé, Director-General of Development Department, Ministry of Transport; Sir Henry Maybury, Director-General of Roads Department, Ministry of Transport; Mr. Frank L. D. Elliott, representing the Home Office; Mr. E. S. Underwood, representing the City Corporation; Mr. G. H. Hume, representing the London County Council; Alderman F. Dent, of the Essex County Council, representing the five County Councils inside the Metropolitan Area but outside the County of London.

Secretary, Mr. J. A. C. Champion, Development Department, Ministry of Transport.

The first meeting will take place on Monday next.

ELECTRIFICATION ON THE NORTH EASTERN RAILWAY.

The *Yorkshire Post* learns that the directors of the North Eastern Railway have provisionally sanctioned a scheme for the electrification of the main line between York and Newcastle, a distance of 80 miles. It is also proposed to electrify the loop line from Northallerton through Eaglescliff and Stockton to Ferry Hill, a length of 31 miles. The details have been worked out by Sir Vincent Raven, chief mechanical engineer of the North Eastern Railway, and Messrs. Merz and McLellan, consulting electrical engineers to the railway.

The new plans provide for a combination of the third rail and the overhead systems, the general idea being that the former should be used on the running lines and the latter in the goods yards and at the large stations. The third rail will be fully protected, and the installation will be in every way suitable for high speed service. All the trains will be hauled by locomotives, but the type has not yet been finally selected.

Liverpool-Prescot Light Railway.—This line, which with the St. Helens Corporation tramway forms the connecting link between Liverpool and South Lancashire tramways, was taken over by the Liverpool Corporation on October 1st, and is now worked as a portion of that system.

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MISCELLANEOUS NEWS AND NOTES.

Birmingham Corporation Light Railways.—The Ministry of Transport has extended until September 6, 1920, the Corporation Light Railway Order, 1912, and Quinton, 1913, for the completion of certain works.

Newcastle Cars for Night Shift Workmen.—Newcastle Corporation tramways have inaugurated a service of workmen's cars to convey to their homes the employees of Armstrong, Whitworth and Company, Ltd., who are working on the night shift.

Cost of Track Construction in London.—It is estimated that the cost of the reconstruction of certain double track of the London United tramways, which Messrs. J. G. White and Company are carrying out, will amount approximately to £30,000 per mile of double track.

Protection of Tramway Officials.—When fining a man at Shepherd's Bush £5 for wantonly assaulting an inspector, the magistrate said that "tramcar officials must be protected in their difficult duties." The magistrate directed that £4 out of the fine should be given to the inspector as cost and compensation.

Matlock Cable Tramway.—At a meeting of the Matlock District Council on October 24 the loss on the Council's cable tramways was considered. A suggestion was made that steam should be substituted for gas as the motive power for driving the engines, as it was estimated that this would amount to a saving of £400 a year. A decision on the matter was deferred.

Efficiency of the London Motor-Bus.—In spite of the arduous nature of their work, the number of involuntary stops made by motor-buses on the London streets during the last twelve months works out at the extremely low figure of one stop for every 10,000 miles run. The broken down London bus is like the proverbial dead donkey—very rarely seen, and these statistics are a tribute to the efficiency of the present day internal combustion engine.

Charing Cross Underground.—Nearly a quarter of a million people use Charing Cross Underground station daily. The number of passengers entering and alighting at this station is made up of 196,000 ordinary and workmen ticket holders, and 32,000 season ticket holders. The District, Bakerloo and Hampstead Railways serve this station, and a total of no less than 2,920 trains pass through the station daily. The new stairways now under construction will relieve, to a large extent, the congestion during the rush hours of what has been described as the world's busiest station.

High Wages Defeat Parcels Delivery at Brighton.—Mr. William Marsh, general manager of Brighton Corporation tramways, reporting with reference to the award of the Interim Court of Arbitration, said that the cost of the concession would amount to about £1,800 for the remainder of the current year and £4,400 for next year. Last year the total wages paid came to about £32,000. For the current year the cost would be over £60,000. Now that the messengers employed in the tramway parcels delivery received 30s. to 35s. a week, the department does not pay and it will be abandoned.

"Safety First" Scholarship.—The London "Safety First" Council, as a part of its policy of educating children to avoid street accidents, recently instituted a competition in essays in the Metropolitan elementary schools. Nearly 50,000 pupils participated. Lord Downham on October 30, presented as prizes 32 war-saving certificates, 200 books and 500 diplomas, in addition to the "Safety First" scholarship to the value of ten guineas awarded for the best essay, which was won by Irene Davis (14), of St. Joseph's Roman Catholic School, Hanwell.

Sheffield Corporation Tramways.—Alderman W. C. Fenton, vice-chairman of Sheffield Corporation Tramways' Committee, recently paid a high compliment to the management of the Sheffield tramways. He denied the statement that had been made that the Tramways' Committee had already decided to raise the fares in December. The Sheffield public, he thought, had been somewhat spoilt in the matter of tramway facilities. Theirs was one of the cheapest tramway systems in the world, the best managed and the cleanest, and none throughout the length and breadth of the Kingdom had been so successful. Mr. Fearnley, the general manager, was looked up to as among the best of tramway managers in England, and the city was getting his services at much less than some other Corporations were paying.

Accident at Burton.—At an inquest held at Burton on October 31, following the death of two persons who were killed in the accident on October 8, when a car overturned and 20 persons were injured, Miss Eva Sedgbrook, a passenger who sat inside at the front of the car, in giving evidence, said she saw the driver work both the hand brakes, the power handle and the magnetic brake, maintaining his grip all the way down hill. She saw the conductress run down the stairs, but did not know what she did. William Lilley, assistant engineer of the Burton and Ashby Light Railway, said the cars were examined every day. After the accident he examined the car and found all the electrical equipment in proper order. All the brakes were off and he did not think the overturning of the car would cause them to come off. If the driver had made use of the brakes at his disposal in a proper manner there would have been no running back. The driver stated that he had driven a car for over twelve years on this particular route. While ascending the hill the leaves on the rail had cut out the power. He applied the magnetic brake and it proved effective for the moment, but a second later the car rushed down the hill. The jury returned a verdict of accidental death and expressed the opinion that it should be compulsory for conductors to be on the rear platform when ascending all gradients.

Birkenhead's Successful Tramways.—Mr. Herbert Halsall, chairman of the Birkenhead Tramways Committee, recently stated that the tramway undertaking would be entirely free from debt and a clear asset to the town within eight years. In the first eleven years they made a profit in seven and a loss in four years, the net profit being £10,000, but during the last eight years the profit was £75,000. There was no tramway in the country, Liverpool not excepted, which carried so many passengers per mile as did the Birkenhead cars. Referring to the development of their motor omnibus service, Mr. Halsall said that it was handicapped by some of the outer districts demanding the extravagant contribution of 3d. per omnibus mile towards the upkeep of the roads.

Extension of Brighton Corporation Tramways.—The Brighton Tramways Committee has recommended that application should be made to the Light Railway Commission for an order to authorise the Corporation to construct a light railway in extension of the tramways from the present terminus in Lewes Road to a point on land adjoining the south-eastern side of the road opposite the lodge gate entrance to Moulsecombe Place. Mr. W. Marsh, engineer and manager, in a report on the scheme, states that after leaving the borough the lines will be laid on private land to the east of the main road on a sleeper track. Mr. Marsh advocates this method of construction as being more economical, and estimates that the cost of the whole extension, excluding the cost of land, buildings or rolling stock, will amount to £13,000.

Nottingham Tramway Accident.—The coroner's jury that inquired into the death of two women who jumped from a Nottingham Corporation car which ran away down a gradient, found a verdict of accidental death, the driver being exonerated from blame. Evidence which was given showed that the passengers were told three or four times to keep their seats, but several of them jumped off. The car, it will be remembered, came safely to a standstill. William Boot, works superintendent, said that each car had four brakes, the hand, the magnetic, the reverse of power, which could not be used if the power failed, and the dynamic or short circuiting method. He found nothing wrong with the brakes when the car was subsequently inspected. Mr. John Aldworth, general manager, said that any one of the three brakes was sufficient to control the car, although the magnetic brake would not stop it.

Opening of Madrid Tube Railway.—The first completed section of the Madrid electric tube railway was officially opened by King Alphonso on October 17. The section covers a distance of about 2½ miles (4 km.) and runs north and south from Cuatro and Caminos to the Puerta del Sol in the centre of the city. There is a double track and a three minutes' service each way will be provided. The trains have a maximum capacity of 500 passengers. The work has taken two and a half years and the opening took place on the exact day forecasted by the engineers when the concession was granted by the Government. Only Spanish capital is concerned in the enterprise and all the rolling stock and equipment, with the exception of a few smaller details, were produced in Spain. The directors and engineers are Spanish and the first name on the list of shareholders is King Alphonso, after whom the company is called "The Metropolitan Company Alphonso XIII." The cost of the first section is about £320,000.

Mutual Obligations of Tramway Undertakings and Employees.—Councillor Guest, at a recent meeting of Wigan Town Council, referred to the way in which the tramway system was developing. There had been a marked increase in the traffic and the car mileage, but they required more revenue and to earn this they must have more cars. At the beginning of the year they had 38 cars, of which on an average 26 were in regular service. They now employed regularly 44 cars, but they could have 50 cars running regularly if they had the skilled labour. The tramways department had not been treated quite fairly by labour. A motorman and five conductors had recently left without giving notice, which was not a reasonable proceeding. The tramways department ought to be treated in the same way as the employees expected to be treated. The men's union could summons the Corporation if the management dismissed men without notice, and, as chairman of the Tramways Committee, he had given instructions to the manager that he must also take action in future against any employee who left without notice, unless there was some good reason for his doing so.

TRAMCAR COSTS AND THE OMNIBUS.

At a meeting of the Bournemouth Tramways' Committee on October 24th, the general manager, Mr. I. Bulfin, submitted a report comparing the carrying capacity and the cost of tramway and motor omnibus service. The figures given are as follows:

	Cost.	Life.	Seats.	Cost per mile.	Cost per Passenger
Omnibus ..	£1,800	5 years	38	26.39d.	2.02d.
Tramcar ..	£3,000	15 years	64	12.91d.	.85d.

The Tramways Committee, in view of this information, decided that they could not recommend the Council to entertain the suggestion that had been made that omnibuses should take the place of tramways. Some new single deck omnibuses are, however, to be purchased. For the new tramway cars that would be required the tramway manager said that he was experimenting with a view to obtaining the best type of car for their purpose. He had asked the Board of Trade for permission to extend these experiments, and would report further in due course.

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CONTRACTS AND ORDERS.

Bournemouth Corporation have accepted the tender of Walter Scott, Ltd., for rails at £47,000, with an additional charge of £500 in connection with the Sandberg inspection during the progress of the contract.

Bayliss, Jones & Bayliss, Ltd. have an order for tie-bars from Bournemouth Corporation.

The Britannia Lamp and Accessories Co., Ltd. are supplying copper bonds for Bournemouth Corporation tramways.

Croydon Corporation have accepted the tender of Bruce Peebles and Company, Ltd., for a 500 k.w. inverted rotary converter at £3,491 and a 1,000 k.w. inverted rotary converter at £5,929.

Edinburgh Corporation have accepted the tender of the Stirling Boiler Company, Ltd. for six boilers at £200,661.

Southend-on-Sea Light Railways Committee have placed an order for three sets of points with Edgar Allen & Company, Ltd.

Thermit, Ltd., London, have an order from Southend-on-Sea Light Railway Committee for rail welds at 30s. per joint.

Sandberg "Insitu" Treatment for Rails.—Messrs. Scholey and Company, of 56, Victoria Street, London, S.W., the licencees and contractors for this process, have received extensive repeat orders from the Corporations of Croydon, Liverpool, Leeds and Sheffield.

Walter Scott, Ltd., have received orders from the Corporations of Southend, Ipswich and Reading for the supply of Sandberg's silicon steel rails treated by Sandberg's patent sorbitic process.

FINANCIAL.

Singapore Electric Tramways.—After providing for debenture interest, depreciation, etc., the accounts for 1918 show a loss of £9,626, converting a credit balance of £4,220 brought down into a debit balance of £5,406, which is carried forward.

Lima Light, Power and Tramways.—A dividend of 1½ per cent. has been declared in Lima. Payment will be made by Messrs. Grace Brothers and Company, 144, Leadenhall Street, London, E.C., on the presentation of coupons.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended November 5 amounted to £75,066, an increase of £12,528 as compared with the corresponding period last year. The route mileage was 141.67, the same as a year ago. From April 1 (the commencement of the financial year) to November 5 (thirty one weeks and two days) the total receipts were £2,536,892, an increase of £493,748 on the corresponding period of 1918.

Buenos Aires Port and City Tramways.—The report for the year ended June 30 states that the conditions under which the undertaking has been carried on by the receiver's representative have been more unfavourable than during the previous periods, and there is now a deficit of £227. Without providing for any administrative expenses of the company or any interest on the debenture debt, the accrued amount for administrative purposes at July, 1918, amounted to £5,800. No scheme of reconstruction has yet been proposed for consideration. A meeting took place on October 28.

Edinburgh Tramway Finance.—The Edinburgh Town Council have instructed the tramways manager, Mr. R. S. Pilcher, and the city chamberlain, Mr. Robert Paton, to submit a new estimate of revenue and expenditure for the remainder of the current financial year, in order that such steps may be taken as may ensure at least sufficient revenue to make the undertaking self-supporting. The results of the last three months' work were regarded as extremely disappointing. While the receipts have considerably increased the operating expenses have gone up to a greater extent owing to increased wages. The following table submitted by Mr. Pilcher covers the operation of the tramways for the first three months (July-September) under Corporation ownership, as compared with the corresponding period last year:—

July-September	1919.	1918.
Passengers carried	23,394,556	21,631,875
Passengers per car mile	14.31	14.77
Revenue	£149,737	£121,193
Revenue per car mile	21.98	19 87
Mileage	1,634,743	1,463,060

PERSONAL.

Sir John A. F. Aspinall, having been appointed consulting engineer to the Ministry of Transport, has resigned his position as director of the Lancashire and Yorkshire Railway Company.

Colonel J. Walker, chairman of the Hull Corporation Tramways Committee, who is retiring from the Council on account of health and business reasons, has been heartily thanked for his services by the Committee. Mr. Richardson, in moving the resolution, referred to the ability and energy which Colonel Walker had displayed during a difficult time. Mr. Raine remarked that the difficult duties which had fallen on the chairman had been exceptionally heavy, owing to the fact that during a period they had been without a manager. Colonel Walker, in reply, said that during the time he had been with them the Committee and the five Sub-Committees had made solid progress. The Committee had worked under considerable difficulties owing to the war, but traffic had increased and the financial side of the undertaking was now on a sound basis.

Cars Wanted at West Hartlepool.—In reply to complaints of overcrowding at West Hartlepool, Alderman Martin pointed out that they could not expect an efficient service with the same cars as were in use before the war, and they were not likely to get new cars yet owing to the moulders' strike.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAME.	Week ended	Latest Returns. 1918	1919	Inc. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	Oct. 28	499	543	+ 44	30	16,582	+ 1,397
Aberdeen Corporation	„ 29	2,279	2,898	+ 619	2	74,034	+ 15,998
Ayr Corporation	Nov. 1	392	463	+ 71	24	20,487	+ 3,769
Belfast City	Oct. 31	8,887	10,291	+ 1,404	31	320,739	+ 69,249
Birkenhead Corporation	Nov. 2	2,849	2,156	+ 693	30½	90,541	+ 21,619
Birmingham Corporation	Oct. 25	24,834	26,485	+ 1,651	31	772,333	+ 65,020
do. Motor Buses	„ 25	1,355	1,682	+ 327	30	52,745	+ 7,396
Blackburn Corporation	„ 29	1,679	2,008	+ 329	31½	74,332	+ 16,274
Bradford Corporation	Nov. 1	10,006	11,248	+ 1,242	31	357,835	+ 67,471
Burnley Corporation	„ 1	2,146	2,899	+ 753	..	..	..
Burton-on-Trent Cor.	„ 2	375	497	+ 122	31	15,685	+ 2,852
Bury Corporation	„ 2	1,934	2,069	+ 165	30½	75,436	+ 10 483
Chatham & District	Oct. 23	1,215	1,451	+ 236	42	64,757	+ 8,990
Cork Electric	„ 22	573	821	+ 248	42	29,745	+ 3 099
Derby Corporation	Nov. 1	1,450	1,886	+ 436	31	60,455	+ 13,253
Dundee City	Oct. 29	1,300	1,466	+ 666	22½	62,006	+ 15,117
East Ham Corporation	Nov. 1	1,390	1,822	+ 432	30½	66,097	+ 12,249
Edinburgh	Oct. 25	8,557	10,482	+ 1,925	16½	103,981	+ 37 810
Glasgow Corporation	Nov. 1	29,066	32 708	+ 3,640	22	716,850	+ 83.357
Glossop (U.E. Sup. Co.)	„ 1	165	215	+ 50	44	9,867	+ 1,925
Huddersfield Corporation	„ 1	3,578	4,714	+ 1,136	31	153,367	+ 33,742
Ilford U.D. Council	„ 1	835	1,131	+ 246	30½	37 611	+ 6,454
Ipswich Corporation	„ 1	625	845	+ 220	31	29,830	+ 5,217
Isle of Thanet	Oct. 29	308	544	+ 236	4½	2,805	+ 1,413
Kilmarnock Corporation	Nov. 1	268	273	+ 5	24½	7,051	+ 747
Lanarkshire	Oct. 23	3,618	4 127	+ 509	42	156,633	+ 3,692
Leeds City	„ „ 1	13,222	15,897	+ 2,675	31	518,379	+ 102.643
Leicester Corporation	Nov. 1	4,383	5,823	+ 1,440	..	..	..
Leyton U.D Council	Oct. 30	2,286	2,916	+ 630	31	98.237	+ 26,628
Liverpool Corporation	Nov. 1	19,485	23,681	+ 4,196	43½	972,239	+ 177,827
London County Council	„ 5	62,538	75,066	+ 12,528	31½	2,536,892	+ 493,748
Maidstone Corporation	Oct. 30	248	351	+ 101	30½	12,323	+ 3,369
Manchester Corporation	Nov. 1	27,137	29,753	+ 2,616	31	948,297	+ 144,524
Newcastle-on Tyne Cor.	„ 1	9,272	8,952	— 320	30	296 672	+ 12,832
Northampton Cor.	Oct. 31	777	1,187	+ 410	31	39.401	+ 12,731
Nottingham Corporation	„ 30	5,562	7,083	+ 1,521	31	224,106	+ 42,655
Oldham Corporation	Nov. 2	3,368	4,169	+ 801	32	143,084	+ 30,519
Reading Corporation	Oct. 30	1,146	1,489	+ 343	31½	49,464	+ 8,643
Rotherham Corporation	„ 29	2,392	2,062	— 330	30½	64,364	— 7,435
Sheffield Corporation	Nov. 2	12,625	15,834	+ 3,209	31½	520,057	+ 92,047
Southampton Cor.	„ 29	2,411	2,348	— 63	30½	83,558	+ 4,470
„ Motor Buses	„ 29	..	161	..	13	1,98	..
Southend-on-Sea Cor.	„ 29	1,030	1,397	+ 367	31	72,953	+ 29,186
South Shields Cor.	„ 16	1,121	1,392	+ 270	29	41,690	+ 7,693
St. Helens Corporation	„ 28	..	1,577	..	4	6,723	..
Sunderland Corporation	Nov. 2	2,296	2,643	+ 347	31	90,475	+ 3,289
Tyneside Trys. & Trmds.	Oct. 22	897	1,684	+ 787	17	21,983	+ 3,678
Wallasey Corporation	Nov. 1	1,567	2,190	+ 623	30½	81,139	+ 21,463
Walsall Corporation	Nov. 1	1,264	1,549	+ 285	31	45,508	+ 6,994
Walthamstow U.D. Coun.	Nov. 1	1,129	1,339	+ 210	31	54,610	+ 9,201
Warrington Corporation	Sept. 25	809	924	115	25	22,663	+ 3,426
West Ham Corporation	Oct. 30	4,329	5,037	+ 708	30½	166 759	+ 27.457
Wolverhampton	Nov. 5	1,644	1 882	+ 238	31	63 264	+ 9.045

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Wks.	Aggregate. 1918-19	Increase or Dec.
Anglo-Argentine	Nov. 4	£53,895	69,091	44	£2,563 352	+ £115,332
Ballarat and Beudigo(4 wks)	Aug. 17	2,996	2,192	20	15,991	— 410
Brazilian Traction (Mlrs.)	Sept.	3,081,000	1,792,0 00	39	83,559,000	+ 5,229,000
Brisbane	Sept.	35,400	41,970	39	340 370	+ 20,516
British Columbia $	Aug.	544,339	667,170	9	1,306,260	+ 350,955
Buenos Aires Lacroze	Oct.	41,843	49,692	17	187,070	+ 21,258
Burmah Tram. & Light Rs.	Sept	30,826	43,152	8	85,835	+ 14,144
Calcutta Rs.	Nov	69,078	87,520	43	..	+ 491,823
Carthagena and Herrerias	Oct,	2,525	1,165	39	26,969	— 13,957
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	Sept.	1,939	2,831	8	5,592	+ 1,678
Hong Kong $	Sept. 6	15,599	15,480	36	529,466	+ 36,106
Kalgoorlie	June	2,747	2,646	26	15,842	— 143
La Plata	Sept.	4,994	5,540	39	51,043	+ 4,728
Lima Soles	July	45,064	49,025	30	331,932	+ 29.742
Lisbon Escu	Mar.	238,290	276,625	..	..	..
Madras (2 weeks) Rs.	Oct. 31	39,598	45,552	42	838.454	+ 40.168
Manila $	Aug.	200 000	193,841	35	1,610,149	+ 170 284
Montevideo	Sept.	29,611	5,552	47	404,201	+ 57,428
Para	Sept.	23,442	24,386	43	216,012	+ 3,964
Pernambuco	Oct. 26	3,524	6,059	42½	223,528	+ 27.138
Peruvian $	July	987,300	1,058,780	..	..	..
Rangoon	Sept.	6,067	3,812	39	58,472	+ 2,892
Shanghai (2 weeks) $	Apr 28	50,760	56,755	16	447,279	+ 53,577
Singapore $	Sept. 6	14,847	15,522	36	549.443	+ 52,451
Toronto $	Aug.	1,070,567	1,083,741	34	8,194,299	— 282,373
Winnipeg $	Aug.	238,974	353,194	34	2,565,812	+ 177 345

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THE Tramway & Railway World
WITH MOTOR TRAFFIC SECTION

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MINISTRY OF TRANSPORT ACT.

A GENERAL REVIEW OF A FAR-REACHING MEASURE NOW COMING INTO OPERATION.

In this issue we give the full text of the Ministry of Transport Act, which received the Royal Assent at the end of the summer session of Parliament. It is a measure destined to have far-reaching, and there is reason to hope, the most beneficial effect on the transportation facilities and through them upon the whole trade and industry of the country. The text of the Bill as originally introduced was published in our issue of March 11 last. It had then just begun to receive the attention of the House of Commons, and there were keen opponents of the measure who foretold its defeat, or, at least, its severe curtailment in many and important respects. The storm of opposition and criticism gathered volume and force as the various interests more directly affected came to understand the almost revolutionary changes that would result from the application of the new proposals. The details proved extremely contentious, but after thorough analysis in a Standing Committee and prolonged debate in the House itself, the Bill secured the assent of both Houses substantially in the form in which it was introduced by the Government, although certain important changes were made to protect various interests that feared capricious or ill-advised treatment by a Government department.

In considering the Act in a general way, it has to be borne in mind that it is part of the general policy of reconstruction of the industrial and social conditions of the country which the Government are hoping to carry out. Other parts are a national electric power supply, land settlement, forestry, agricultural development, large housing schemes and so forth. The programme is a great and ambitious one; but, in the circumstances in which the country finds itself, it is highly necessary. As to the necessity of the Transport Act in particular, something had to be done to reconstitute, co-ordinate, and enlarge transport facilities. Obviously the proper method to promote development with full co-ordination so as to avoid overlapping, confusion, and waste, was to put the entire transportation agencies of the country under one general skilled control. Even those who fear the added power of bureaucracy had to admit that something of the sort was desirable. Their fears have to some extent at least been met by provisions for the constitution of expert advisory committees and by concessions to the dock authorities and other interests concerned. It is worthy of note that the railway companies, who are more affected than any other carrying agencies, offered no opposition to and very little criticism of the Bill. They were, of course, already under Government control. So far as the present constitution of the Ministry of Transport is concerned, the country has good reasons for reposing confidence in Sir Eric Geddes and in the band of skilled administrators and engineers who have been appointed heads of departments under him. They have a formidable task, but, as in so many other cases, they will find "nothing so difficult as a beginning." The country is watching their action with the more interest because the powers conferred on them are so large and general, and so much freedom is left to them as to the actual measures which they will carry out.

POWERS AND DUTIES OF THE MINISTER.

The Act (which it may be recalled was originally named the Ministry of Ways and Communications Bill) is considerably longer than the original Bill, and it now consists of 30 sections and two schedules. The first section provides for the appointment of the Minister, and the second gives an idea of the sweep of his duties by transferring to him all powers and duties of any Government department in relation to railways, tramways, canals, roads, bridges, and ferries, and vehicles and traffic thereon, and harbours, docks, and piers. For the most part the Board of Trade is the Government office concerned, as its powers in reference to railways, tramways, etc., were extensive. What will become apparent to every man practically engaged in the business is that there will be no more Board of Trade regulations, inspections, accident inquiries, and so forth; they are now issued and carried out by the Ministry of Transport. An addition which was made to the section provides that there shall be attached to the Ministry a separate department charged with dealing in the ordinary course of departmental business with road construction, improvement, maintenance, and development. This was one of the amendments made to conciliate the motor vehicle interests, who professed alarm at a prospect of what they described as roads and road interests being made subservient to railways.

THE TWO YEARS' PERIOD.

"With a view to affording time for the consideration and formulation of the policy to be pursued as to the future position of undertakings," a number of provisions are set out in Section 3 which are to have effect for two years after the passing of the Act. Possession of the already-controlled railways is to be retained for the two years by the Minister, and he may take possession (which really means control) of any other railway or any tramway, other than a tramway belonging to a local authority. The exclusion of municipal tramways from the scope of the Minister is one of the curiosities of the Bill. No definite reason was given, except that those tramways have hitherto been on the whole financially prosperous, and that the

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municipalities objected to their being taken over. The absence of general control of municipal tramways leaves a hiatus in schemes of co-ordination; but the new Ministry will, no doubt, have a beneficial influence in securing more harmonious action among all tramway-owning bodies than has hitherto been obtained. The Minister further may take possession of any canal or any harbour or dock undertaking, subject in the latter case to reservations in Section 4. The management and servants of the undertakings are to obey the directions of the Minister as to user, rates, fares, working, improving, securing co-operation, running powers, etc. Financing will, as far as possible, remain with the owners. The Minister may authorise the owners to acquire land and construct works. Any rate or fare fixed by the Minister shall be deemed to be reasonable, notwithstanding any agreement or statutory provisions, and may be charged for 18 months after the two years. The right of local authorities to purchase tramways is not affected. These and minor provisions of the section, though they persist for only two years, gave rise to an enormous amount of discussion in Parliament, and various detail changes were made before the final form here summarised was reached. One imperative task that the Ministry must accomplish during the two years is to devise measures to put the railways on a proper financial basis. In view of the enormous increase in the wages bill since the outbreak of war, this problem is one of serious difficulty. The Ministry has, however, lost no time in grappling with the problem, for at the end of October the announcement was made of the appointment, under Section 21 of the Act, of a strong committee, under the chairmanship of Mr. F. Gore Brown, K.C., to consider the question of the revision of railway rates.

Harbours and Docks.

The vigorous opposition by the harbour and dock interests to being brought within the scope of the Act resulted in a Government concession of some importance—on paper at least. This is embodied in Section 4, which provides that, except where a harbour, dock, or pier forms part of a railway undertaking, nothing in Section 3 shall apply to any harbour, etc., established by Act of Parliament, without the consent of the owners. If, however, at any time during the two years the Minister considers it desirable in the national interest that the facilities and accommodation at the harbour should be improved or that the method of working should be altered, the Minister may by order require the owners to execute improvements or extensions or alterations in the method of working. Against such an order the owners may appeal to the Lord Chief Justice if they consider the requirements are likely to be seriously injurious to the undertaking. If they can make out a *prima facie* case, the Lord Chief Justice is to appoint an arbitrator to decide the matter. In this somewhat complicated way the rights of the owners are protected, and at the same time the Minister has power to secure co-ordination of working between the harbours and the railways.

Through Running on Tramways.

Section 5 is of importance to tramway interests, for it sets out that the Minister shall have powers to require through runnings on adjoining tramways belonging to different owners, and in default of agreement between the owners, to settle the terms of the through running. This power ought to prove valuable, especially if there is to be an extension of interurban tramways.

Elaborate arrangements are contained in Section 7 as to transfer of officers and servants, abolition of offices, compensation, and so forth. The next section contains provisions as to claims against and by the Minister in respect of the exercise of his powers.

New Transport Services.

Section 9 makes it lawful for the Minister to establish and work transport services by land and water, and to acquire land and construct works. A Parliamentary fight took place on the limitations to this power, and as the matter was settled no new transport service is to be established until an estimate of capital expenditure and details of the scheme have been approved by the Treasury. If any estimate exceeds £500,000, or if compulsory acquisition of land or the breaking up of roads is involved, the Minister shall not exercise his powers unless authorised to do so by Order in Council, which must be approved by Parliament. The Minister may give the owners of existing undertakings the opportunity of establishing the new services, should that course appear preferable. New construction under the section must be commenced within two years.

New Routes for Omnibuses.

By Section 12 it is provided that Section 20 of the Local Government (Emergency Provisions) Act, 1916, (which relates to the establishment of new routes for omnibuses) shall continue in force for two years, and it is additionally provided that where the licensing authority refuses to grant a licence for an omnibus or grants a licence subject to conditions, the applicant shall have a right of appeal to the Minister. This power ought to be of value in cases where licences are unreasonably withheld, but the position may be a difficult one where the application is for leave to run omnibuses on routes occupied by tramways belonging to the licensing authority.

Purchase of Privately-owned Wagons.

Great improvements in goods traffic on railways are anticipated from the powers conferred by this important section (No. 13). It will be lawful for the Minister to purchase privately-owned railway wagons on terms authorised by an Order in Council approved by Parliament, and to work or lease the wagons, or to apportion them among the railways. By getting control of the enormous number of privately-owned wagons and co-ordinating their use with that of the railway companies' wagons, and sending them wherever most required, the hope is that the carrying power will be much increased and delays to goods and minerals in transit minimised. Capital liabilities may be discharged by the issue of securities (Section 14).

Financial Aid for Development.

By Section 17 the Minister may make advances either by grant or loan to any authority, company, or person for the construction, improvement, or maintenance of railways, light railways, or tramways; roads, bridges, or ferries; harbours, docks, or piers; and canals. This will take the place of advances through the Development Commissioners. The Minister is not to make an advance exceeding £1,000,000 at any one time, unless specially authorised by a resolution of the House of Commons. The power under this section should prove valuable not only in itself, but because the Minister will be able to see the best cases for development in relation to existing undertakings.

Rates Advisory Committee.

The constitution of this Committee, which, as mentioned above, has already been appointed, is set out in Section 21. It proved the main stumbling block between the two Houses of Parliament when considering the Bill, and at one time a deadlock was threatened. As finally adjusted, the section sets out that for the purpose of giving advice and assistance to the Minister with respect to, and for safeguarding any interests affected

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by, any directions as to rates, fares, etc., a Committee shall be appointed consisting of five persons—the chairman to be a person experienced in the law, nominated by the Lord Chancellor, two representatives of trading and agricultural interests nominated by the Board of Trade after consultation with interests concerned, one representative of transportation interests nominated by the Minister after consultation with interests, and one representative of labour interests concerned nominated by the Minister of Labour after corresponding consultation. There may be an additional member nominated by the Minister from time to time. Before directing any revision of rates and fares, the Minister shall refer the matter to this Committee for their advice. The Committee are to hold inquiries when necessary and may take evidence on oath, and the members of the Committee may be paid. In regard to this and other Committees attempts were made when the Bill was before Parliament to make it obligatory on the Minister to take the advice of the Advisory Committees, but the Government successfully resisted the claim, holding that it would destroy the ministerial responsibility to Parliament and the country.

THE ROADS ADVISORY AND OTHER COMMITTEES.

The Rates Committee is the one to which most importance is attached, as the matters with which it will have to deal are large and complicated. Another body, however, of some consequence, conceded by the Government in response to the motor vehicle interests, is provided for by Section 22. This is the Roads Advisory Committee, which is to advise the Minister in relation to roads, bridges, and vehicles and traffic thereon. The Committee will consist of not less than eleven members, five representative of highway authorities, five of users of horse and mechanical road traffic, and one of labour, all appointed after consultation with the interests concerned. For the purpose of giving advice generally, the Minister is to set up (Section 23) a panel of experts and of impartial persons of wide commercial and trading experience appointed from nominees of the undertakings affected by the Act, and of labour, trading interests, local authorities, etc. Before taking possession of undertakings against the wish of the owners or establishing new transport services, the Minister must refer the matter to an Advisory Committee selected by him from the panel. All these Committee arrangements, it will be noted, are in the direction of aiding the Minister, and also of modifying his powers.

MISCELLANEOUS.

Among ancillary sections, local authorities will be glad to note that by Section 24 the Minister has no power to impose any conditions on a local authority which would entail expenditure without the consent of the local authority or of the Minister of Health.

There is to be only one paid Parliamentary Secretary of the Ministry. The Minister's salary is fixed at £5,000 and that of the Parliamentary Secretary at £1,500.

MEXICAN TRAMWAYS COMPANY.

The statement recently published in New York newspapers to the effect that the Mexican Government had entered into a contract with the Mexican Tramways Company for a resumption of the construction of the tramways between the City of Mexico and Puebla is denied, but it is stated that an arrangement has been made with the Mexican Government whereby the time limit for the construction of the line has been extended for a further six and a half years. As is well known, the property of the company was taken over by the Mexican Government several years ago, and the lines were operated by it until May last, when they were handed back to the company which is now working them. It is too early yet to judge whether the tramways can be operated without loss, but the managing directors hope to be able to do this.

ORGANISATION OF THE MINISTRY OF TRANSPORT.

We have been favoured by the Ministry of Transport with the chart of organisation of the Ministry which is here reproduced. That such a diagram has been prepared and issued is in itself an indication of the business-like efficiency which already distinguishes the new Ministry.

It should be said at once that the organisation which is indicated in the diagram is quite different from that of any other British Government department, and there is good reason for believing both from the organisation shown and from the character of the personnel that the Ministry of Transport will set an example to other Ministries of efficiency and rapidity in carrying on the work. Every effort has, we believe, been made to exclude " red tape " methods and to put the whole of the arrangements on a business-like basis. First in the matter of departure from precedent may be mentioned the fact that the Transport Ministry is the first Government department to combine the posts of secretary and solicitor in one person. This change in itself is likely to be advantageous. Then in other Ministries the secretary alone is responsible to the Minister for the executive work, all of which is done through him. In this case each department of the Ministry has its own chief, who is directly responsible to the Minister without any intervening channel of communication. To guard against any possible want of co-ordination, it will be noted that each branch has a secretarial department. It is the business of the assistant secretaries to prevent overlapping and want of co-ordination. A further point is that all important posts under the Ministry are occupied by experts in the particular branches in which they are respectively engaged. As everyone knows, Sir Eric Geddes himself is a great practical authority on transportation. Similarly the heads of departments whose names are shown on the diagram are well known authorities on the subjects with which they have to deal. Their subordinates also are well qualified to deal with the matters under their care. In their case, however, civil service tradition has been adhered to with respect to the names of the men filling posts below heads of departments not being publicly stated. " A Ministry of all the talents " was a phrase which used to be sarcastically applied to some past Governments of this country, but it may be said quite accurately that the Transport Ministry contains more talent in special directions required than some other Government departments have done.

A straw showing how the wind of expedition is going to blow may be noticed. The Ministry's Advisory Committee on Railway Rates held its first meeting and arranged its course of procedure on October 30, which was only two days after the members of the Committee had been appointed. That does not mean that the Committee will speedily conclude its labours, as the amount of work in connection with revising goods rates is enormous. It shows, however, that the intention is that no time is to be wasted.

Outside of what is shown in the chart, the Ministry has the advantage of expert advisers. First, there is Sir John Aspinall, so well known for many years as the general manager, and subsequently a director of the Lancashire and Yorkshire Railway, who is consulting mechanical engineer. Then there are the Advisory Committees. Most important of these in many respects is the Committee on Rates, already mentioned, the constitution of which is set out on another page of this issue. The existence of this Committee and the

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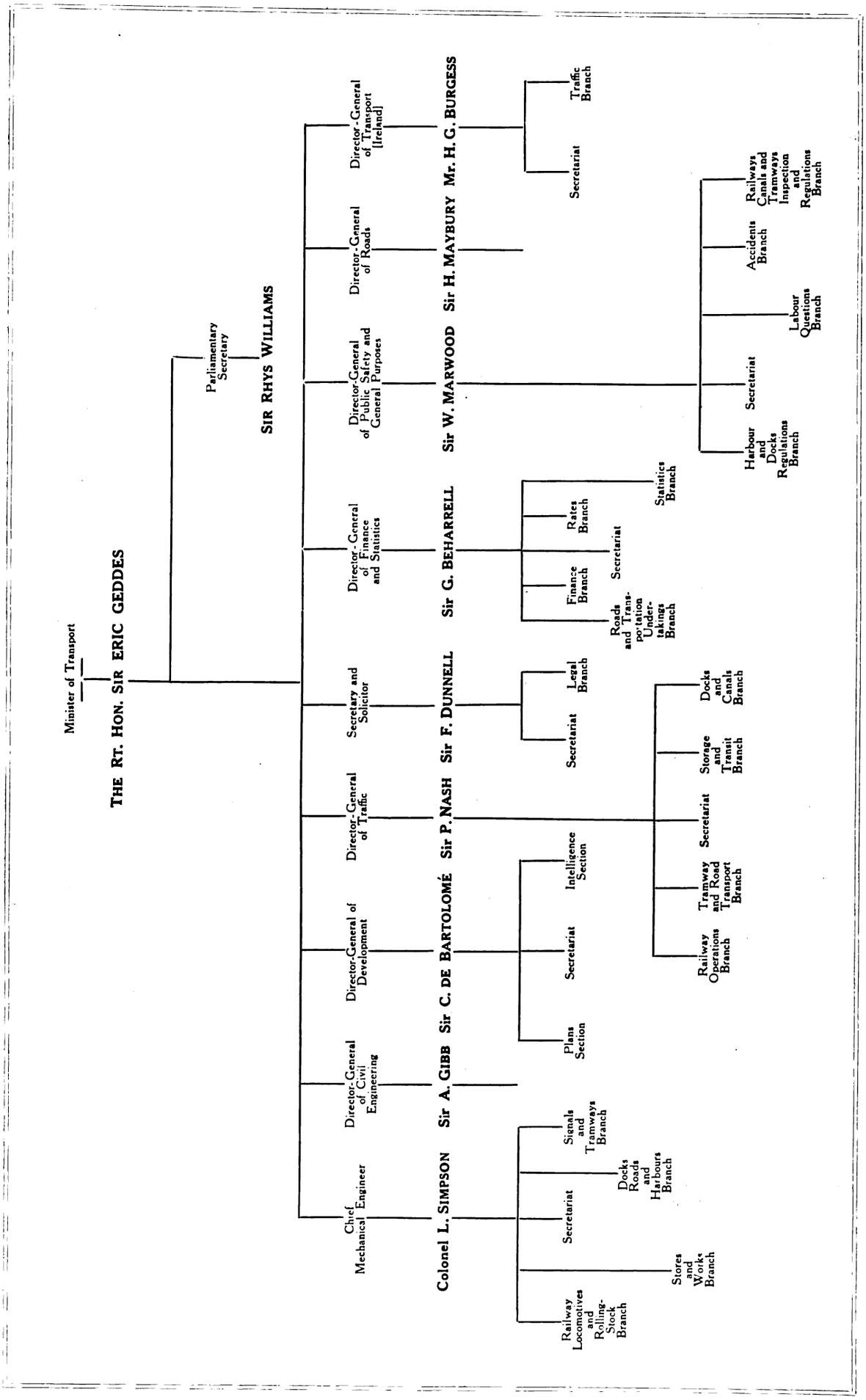

Present Organisation of the Ministry of Transport

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method of constituting it are provided for in the Ministry of Transport Act. The same remark applies to the Advisory Committee on Roads. The Minister also has power to appoint other Committees of advice as required. At the end of October it was announced that a Railway Committee with advisory functions was about to be appointed as a successor to the Railway Executive Committee, which performed such important functions during and since the war. There has also been formed an Advisory Committee for London Traffic. On the work and recommendations of this Committee will probably depend the question whether the suggested separate Traffic Board for London will be set up. In the meantime the Government have decided that London traffic matters are to be within the scope of the Ministry of Transport. The obvious difficulty in that connection is that the powers of the Ministry under the Act with regard to municipal tramways are somewhat limited.

Referring now to the chart, there is, apart from the other arrangements, the post of Parliamentary Secretary, to which Sir Rhys Williams, M.P. for Banbury, has been appointed. As in the case of other Ministries, the Parliamentary Secretary will assist the Minister, particularly in connection with his Parliamentary duties. Then, in addition to the secretary and solicitor, there are eight heads of departments all directly responsible to the Minister. The secretary and solicitor attends to general organisation and sends in the reports to the Cabinet. He is also responsible for legal advice.

The details of some of the departments are not yet complete, but it will be noticed that as far as they go, three of the departments have branches specifically relating to tramways. One is the department of the chief mechanical engineer, the second that of the director-general of traffic, and the third that of the director-general of public safety and general purposes.

Standardisation will come under the mechanical engineering department. The development section has not only to attend to means for providing facilities needed by developments of trade, but to keep itself informed as to what developments are going on or in prospect, so that transport schemes may be prepared to meet them. Traffic not only by rail but by road, canal, and seaports will come within the purview of the traffic department. The system of allocation of traffic already in operation as regards the transport of goods by railway will probably be greatly extended. This traffic department may be expected also to work closely with the Advisory Committee on London Traffic. The finance department will prepare the annual estimates and watch the proposals of other departments from the financial point of view. It will also scrutinise railway and other accounts and prepare statistics for publication. The section of the finance department dealing with rates and fares will work in conjunction with the Rates Advisory Committee. The railway statistics, formerly issued by the Board of Trade, will be prepared by this department. Among the duties transferred from the Board of Trade, a number go to the department of public safety, including the inspection of new works. Pay and conditions of service on controlled undertakings will also fall to this department. The roads department will, among other things, continue the work of the Road Board and will act with the advice of the Roads Advisory Committee. The Irish department is not very fully developed, but doubtless a great deal of the work of the other departments will apply alike to the three kingdoms.

For all matters relating to the development and improvement of means of transportation the country has now been provided with the machine. With expectation the country waits to see how the machine will work.

THE CRISIS IN THE TRAMWAY INDUSTRY.

Great Service Performed—Over 3,500 Million Passengers Carried.

Reasonable Conditions Necessary to Secure Efficient Operation.

The following statement has been issued by the authority of the Conference of Tramway and Light Railway Companies.

The financial position of electric tramway companies in Great Britain is a source of increasing anxiety. The repeated increases in wages, the improvement in the working conditions of the employees, the rise in the cost of materials for track and equipment, and the impossibility of carrying out repairs and renewals during the war have multiplied the burdens on tramways to a degree which, in spite of increases in traffic, has undermined the financial stability of the whole industry. By the recent award of the Interim Court of Arbitration, the total war bonus paid to every tramway worker over and above his basic rate of wages has been increased to 34s. per week. In addition the agreement of March last for a reduction of the working hours to 48 per week without a corresponding reduction of wages has further increased the cost of labour, so that the wages bill alone amounts to more than double the pre-war figure. It is well known that the price of such materials as steel, oil, coal, and wood, which are amongst the principal requirements of the tramway industry, has risen to a crushing extent.

In the case of any ordinary industry supplying a public need, increases in cost are met by raising the price of the service. It is fully recognised by tramway companies that tramwaymen must be paid wages which will bring them on a level with men in similar occupations elsewhere, but it follows that the fares paid by the travelling public must be adequate to provide this higher standard of remuneration and to maintain the undertaking in a sound physical and financial condition. The companies are, however, subject to statutory limitations of fares and the obligation imposed by Parliament in the infancy of the industry, when conditions were radically different from those of the present day.

The injustice of maintaining these limitations of fares intact was so patent that as a result of the report made by a Select Committee of the House of Commons the Board of Trade granted a measure of relief under the Statutory Undertakings (Temporary Increase of Charges) Act, 1918. It is no more than partial and temporary relief, limited to a period of two years after the war. Before a tramway company can get any relief at all it must prove that it has been adversely affected by war conditions; and the utmost it can obtain is permission to raise its fares to a point calculated to enable it to pay two-thirds of its pre-war dividend. In other words, the mischief must be done before any remedy becomes possible, and the official remedy is temporary and incomplete for a trouble which is permanent and likely to grow more serious.

Municipal tramways, on the other hand, are by this Act enabled to increase their fares to such an extent as will ensure their full interest and sinking fund. It is, moreover, open to them at any time to cover any losses by drawing upon the rates, although there are weighty objections to such a course. No such recourse is available to tramway companies. They are, further, subject to purchase by local authorities at certain periods on terms which involve the provision of substantial reserves to meet the eventual loss on capital account at purchase. It has been the custom

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of tramway companies to set aside reserves for this purpose and for renewals, and their investments on this account have suffered the war depreciation of about 30 per cent. in the value of gilt-edged securities.

Apart from limitations on fares tramway companies work under serious disabilities which are not realised by the general public. They are legally bound to maintain not only the rails they use but the surface and substructure of the roadway between and bordering the rails. Many tramway companies are, in fact, under obligation to maintain the whole width of the roadway, frequently for the benefit of competing traffic. This burden of maintenance has more than doubled since the beginning of the war.

It is important also to bear in mind that most tramway undertakings are obliged to carry workmen at a statutory fare of ½d. per mile, or at even cheaper rates, adopted at a time when the purchasing power of money was double its present value. Workmen's fares were never really remunerative, and to-day they involve a heavy loss which has to be made up by increase of fares within the statutory limits to the ordinary passengers.

The maintenance of an efficient and progressive tramway industry is a matter of national importance. In the year before the war tramways in Great Britain carried close upon 3,500 millions of people—nearly three times the number of third-class railway passengers. Since then tramway traffic has grown, and still further demands will be made upon the industry. At a time therefore when tramway undertakings find themselves called upon to reconstruct their track and equipment after the inevitable delays of war, to improve and develop their services, and to adjust their finances to the new conditions created by the demands of labour, they are refused any material relief from the restrictions and burdens of pre-war days. Unless something is done, and done swiftly, tramway services must deteriorate, to the loss not only of tramway shareholders but of the whole travelling public. The inevitable end—assuming the existing tendencies to continue acting—is bankruptcy, first of the weaker undertakings and later even of the strongest. Already in America, where somewhat similar conditions as to fares and wages prevail, over 13 per cent. of the electric tramway undertakings fell recently into the hands of receivers, and a Special Commission has been appointed to save the situation for the whole industry.

If the tramway industry is to continue to pay the additional wages imposed under Parliamentary authority, to provide a thoroughly efficient service, and to assist housing schemes by rapid transportation, it must be put on such a basis as will enable it to yield a fair return on the capital already spent and to attract fresh capital for the developments required in the public interest.

There are two directions in which the Government is called upon to secure reasonable conditions for tramway companies. One is to amend the antiquated limitations on maximum fares. The other is to relieve the undertakings of road maintenance and other expenses which do not properly belong to the tramway service.

New Light Railway in Cheshire.—An order made by the Light Railway Commissioners and confirmed by the Board of Trade, authorising the construction of a light railway in the parishes of Little Sutton and of Netherpool, Cheshire, has been issued as a white paper. The capital of the company will be £75,000 in £10 shares, and Mr. Herbert Levinstein and Sir H. D. McGowan, and two other persons nominated by them, are the first directors. The railway commences at Little Sutton Station by a junction with the joint railway of the L. & N.W. and G.W.R., and terminates in Netherpool.

SAFETY CARS ON VIRGINIAN TRAMWAYS.

By An American Correspondent.

Some fifty "safety cars," similar in design and construction to those described and illustrated in the issue of this journal for August 14 last, have recently been put in service on the tramways in various towns in the State of Virginia controlled by the Virginia Railway and Power Company. Twenty of these cars are in operation in Petersburg, 12 in Norfolk, and 18 in Richmond.

In Norfolk, the cars operate on the Atlantic City, East Main and Brambleton line, which passes through the very narrow congested streets of Norfolk, including Granby Street, the principal thoroughfare. Formerly this line was operated with seven cars on a ten-minute headway. Now a seven-minute service with ten cars is given. Car mileage has been increased 38 per cent., and the number of revenue passengers has increased approximately 20 per cent. In Petersburg the cars are used to replace old single-truck longitudinal-seat cars, with a seating capacity of 24 passengers. With the decreasing soldier traffic from Camp Lee, the density of travel did not warrant an increase in service, so that a car for car replacement was made. The new cars are so convenient and comfortable, however, that a slight increase in travel has resulted.

In Richmond the cars are operated on the Belmont Avenue and the Laurel Street lines, both of which traverse the most congested sections in Richmond. Service has been increased on the Belmont Street line approximately 55 per cent., and on the Laurel Avenue line approximately 40 per cent.

On Wednesday, August 6, a test trip was made by the Mayor of Richmond, accompanied by city officials, to investigate whether or not the operation of a street car by one man was hazardous. The car was put through various "stunts" on the level and on some of the 7 and 8 per cent. grades, and the entire investigating committee, including the Director of Public Safety, are reported to be enthusiastic over the car and convinced that the safety features were designed for every emergency. In a report made at the meeting of the City Council's Committee on Streets, Director of Public Safety Myers declared that the one-man street car used in Richmond was a "thoroughly safe car," and that the modern appliances with which it is equipped "make it the safest of any car operated by the Virginia Railway and Power Company in the city."

The maximum permissible load in the car is placed at 50 passengers, and when the car has this number of passengers aboard, a sign is shown, and no more passengers are admitted, a rule described as a welcome innovation, for an American street railway car is in general never supposed to be full so long as one more passenger can possibly find standing space.

As in other southern cities, separation of the races is necessary on all lines of this company, and when the safety cars were put into operation the following sign was placed in the centre of each car :—

> Coloured patrons will please fill the seats from the rear.
> White patrons will please fill the seats from the front.
> Thank You! Virginia Railway and Power Company.

No trouble has resulted from the operation of this car on this account. The first lines, however, on which the new cars have been run are those with what is described in Virginia as "light coloured" travel.

In order to decrease the work of the car operator as much as possible, the number of reports is cut down to

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a minimum. Non-recording fare boxes are used, so that the only reports made at the end of a day's run are the time on and off and the register reading upon taking the car and leaving it. The elaborate trip reports have been entirely discarded. A simple form of safety car transfer has been designed which will permit the operator to punch the time before starting from the end of the line and will necessitate only one more punch at the time of issuing the transfer.

The cars are of the standard Birney type, manufactured by the American Car Company of St. Louis, are arranged for operation at either end, and a large number are equipped with Westinghouse sleeve-bearing No. 506 motors, type K control, and Westinghouse air brakes.

The accident department of the company are particularly enthusiastic over the new cars, for they have had only two slight accidents after operating 324,000 miles.

In preparing the public for this type of service, an educational campaign has been conducted for the past ten months, starting before the cars were even purchased. Full descriptions of the cars, places where they are used, advantages to the public, and other details have been given in an interesting and instructive manner. This campaign was carried on through the bi-monthly company publication, "Public Service News." The following is an excerpt from the issue of July 31, 1919:—

SAFER AND BETTER SERVICE WINNING FAVOUR FOR "SAFETY CARS."

Not only is it true in Richmond, but wherever the safety cars have been put in operation, they are "making good."

The month's trial in Richmond has proven everything claimed for them—Safety, Quicker Service, and less Noise. On the Belmont line they have made it possible to increase the schedule from ten minutes to seven minutes, and on the Laurel Street line from seven minutes to five minutes, and so far they have a clean accident record.

The step accident which is so prevalent with the two-men cars is entirely eliminated in the safety car, since there is no possibility of mis-signal with the bell cord, or of a passenger alighting while the car is in motion.

That collisions are also minimised by reason of the lightness of the car and the many safety appliances with which it is fitted, has been demonstrated in a number of instances during the trial here, when several near collisions were successfully avoided by reason of these special features. The single criticism appearing in the Press when the cars were first put on, that passengers would be hopelessly "boxed in," should the front of the car be rammed in by a collision, is, of course, without foundation, because the rear doors would be available, and that it is safer for passengers to remain on the car in the event of collisions.

The safety cars are popular with ladies, because they are easy to board and to leave. They are popular with riders and non-riders because they move through the streets so quietly.

For many years car builders have been turning out different types of cars with a view to combining safety, speed, and quieter operation, all in one, and only did they succeed when they built the safety car in response to the demand of our principal cities where congestion, by reason of war activities, made more and quicker transportation facilities imperative.

The safety car was originally planned and built to take care of a big situation, and even though the war is now over, the transportation problem in our country is still big enough not only to warrant its continued use but to encourage its wider operation in the interest of better transportation service.

INTERNATIONAL TRAMWAYS UNION.

The London County Council have approved the continuation of its membership in the reconstituted International Tramways Union. Owing to the changes in the international situation as a result of the war, the old Union, as reported in our issue of June 19, was dissolved and immediately reconstituted with members belonging to the entente and neutral countries only. The annual subscription to the Union is based on the gross receipts of the constituent members, and in the case of the London County Council amounts to £12 a year. This subscription enables the Council to send one representative to the biennial congress if desired.

NEW SIDE CONTACT DESIGN FOR RAILWAY ELECTRIFICATION.

By E. Goolding.

There are now in practical operation three ways of obtaining contact with a conductor rail, viz., top, side, and under running contact. The use of a conductor rail in the electrification of railways has found favour, and the number of devices for obtaining contact between the collector shoe and the rail is likely to be further added to in the near future. It therefore becomes of interest to consider new designs or suggested improvements on existing methods to ascertain which presents the most advantages. At one time the question of extra labour or material involved in the erection or maintenance was not of paramount importance; but the present outlook compels a somewhat more careful investigation as to ways and means, and the modification of one's ideas in order to conform with circumstances.

It must be borne in mind when designing new methods or modifications that they cannot be carried out without practical trials, and it is only after experimenting that it is possible to develop an efficient system. The systems now in vogue are the outcome of much careful work from the drawing office to the experimental stage, and it may be taken for a fact that it is necessary to ascertain whether a new design or any deviation from existing systems is good and sound in practical operation before any start is made on the scheme proper. On several undertakings with which the writer has been connected no work was put in hand until the designs were proved satisfactory in practice, and it has been very gratifying to know that in all cases the experimental work has given openings for improvements by the development of some condition not foreseen.

The main object is to simplify the work of erection and maintenance so as to reduce the cost of material and labour to a minimum. To do this experience has shown that it is necessary to standardise the drilling and bonding of rails, the location and distance of feeder terminals and bonds, the spacing and clearance at ramps, system of sectionalising, system of anchoring also single line working at stations, crossovers and junction layouts, wood protection lengths, the adjustable clamps by which the wood protection is fixed to the rail, the cross bond casing, clips, and jumper cable clamps. All these parts must be interchangeable.

The location of the rail on the left or right hand side of the track should be considered with the object of safety and of avoiding modifications to signal gear. After the rail is erected and ready, the protection should always be capable of erection at a rapid rate without calling upon mechanics, drillers, and carpenters to assist in the assembly. By preparing the protection in standard lengths, and delivering on site ready to be clamped on to the rail by semi-skilled men at the rate of several miles a day, simplicity and economy are promoted. Most systems take advantage of some simple clamping device for holding the protection in position, which can be so chosen as to avoid the various obstacles. This method does away with the tedious and expensive task of drilling the rail, and, by standardising the lengths, avoids the waste of sawing up good material.

In this matter it has been found impossible to take advantage of punching holes in the rails at the works, since the rails are not all the same length when delivered, as allowances are always given for a percentage of shorts and mediums to avoid waste in manufacture. Then, again, after being installed the sections are

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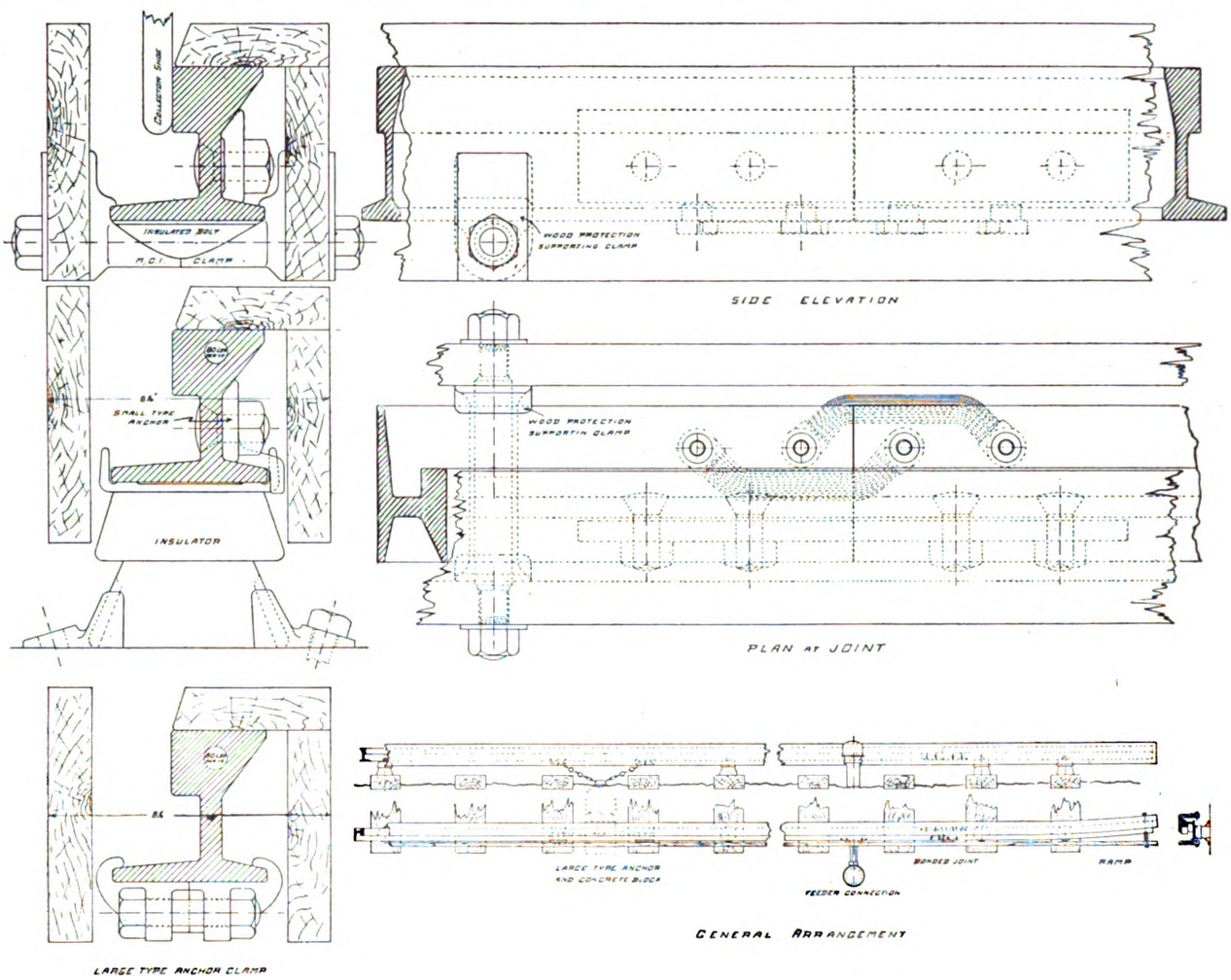
built up of different lengths to make up anything from 8 yards to 880 yards. This, combined with the fact that usually three or four different standard lengths of protection are used (for economical reasons), makes it impossible to utilise holes already in the rail, as the means of supporting the protection have to be carefully arranged after erection, so as to avoid feeder terminals, fishplates, and insulators. Hence it will be readily seen that not one hole out of a dozen will be punched in the rail at the place required, so the present practice of using movable clamps is simply the outcome of economic and practical necessity.

When considering the installation of a conductor rail, it will be necessary to inspect the sleepers to see if they are long enough to support the insulators.



New Side Contact Design for Railway Electrification.

This is generally a very important item, as most sleepers do not extend sufficiently outside the track rail, and may mean 400 to 500 long sleepers per mile in place of those found too short. It is usual to place insulators about 9 ft. 6 in. apart on the straight and 7 ft. to 8 ft. on short or curved lengths. The splicing of extension pieces on to sleepers is not satisfactory.

The erection of a conductor rail is done in stages by separate gangs until the rail is in position bonded with ramps and anchors; if delays take place in certain sections (as is invariably the case), the gangs necessary for the completion of the work have to return, and this is one of the reasons why it becomes essential to look well ahead and anticipate the possible modification in road bed, track, sleepers, and signal rodding. Another important item is the supply of special tools, but this is entirely a matter of experience, since the work differs considerably from the ordinary routine.

As previously mentioned, all systems now in use are the outcome of tedious and expensive experiments; there is no system running that has not undergone the process in order to obtain efficient bonded, insulated, and protected rails to give a smooth lead on, and contact for a rapidly moving metal shoe. All experienced in this work know the many little difficulties to be contended with before the object is attained; and it will be conceded that the first matter of importance when deviating from known systems is to obtain assurance by practical demonstration before putting through orders for material.

The top, side, and under running contact systems have their advocates, and in the new side contact design illustrated in the accompanying drawings it is hoped that the advantages pertaining to different designs are assembled with practical consideration of what goes to fulfil the demands of an efficient, well-protected rail embodying simplicity and standardisation in construction.

The points of advantage claimed are—

Compactness;
Complete protection to live parts;
Free drainage;
Low centre of gravity;
Room for anchoring and cable connections;
Straight board protection with movable clamps;
No drilling of rail for protection or anchors;
No ramps required (rail can be bent at ends);

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Liberal clearance for shoe movements;
Area of rail 80 in., or 80 lb. per yard;
Ratio of conductivity, 7 to 1;
Shoe contact area, 2 in.

It will be observed from the drawing that the overall dimensions are only 8¼ in., and that the rail is completely covered by creosoted wood. There is no chance of dirt or snow accumulating, as an opening is allowed on each side of the rail flange to give free drainage. The bonds are put under the wide flange where there is room for the use of a screw press. The bonds are 4/0 SWG, 6 in. centres, flat ribbon type bent as shown.

The rail is well balanced, and will not overturn even with very short lengths. As will be seen, there is room for anchor clamps between the protection boards; in fact, the shape of the rail admits of all live parts being covered by the protection.

The protection itself is of the simplest type, the boards being 1¼ in. thick, and the width only 7½ in.; this thickness, which on a drawing may appear to be on the heavy side, is in practice found to be the most serviceable for the work. The method of support is by means of movable clamps which can be fixed where desired in a few minutes. The clamping bolt is insulated along its length with a mica compound moulded on, and the two M.C.I. grips clamp on to the rail flange and butt up against one another, keeping the boards rigid and vertical; the top board resting on the head of the rail gives additional strength.

There are no special ramp pieces required, as the rail can be curved to make a gradual incline surface of ½ in. in 5 ft., the nose of rail being bent 2 in. out from striking point of shoe. The shoe strikes the conductor about 18 in. from the end of the rail, and touches the conductor on the fine incline or curve. The ramps are accurately fixed and bent to gauge, so that a shoe travelling 40 miles an hour obtains gradual contact without jumping or knocking. The shoe is about 9 in. wide by ⅞ in. thick, with a weak neck, so that in the event of fouling anything it breaks off instead of damaging the conductor rail.

It will be observed that the insulator is practically of a standard type that has given good results; the ears are 1 in. high to prevent the conductor rail mounting on them, may happen if they are any shorter.

There are many further considerations to be advanced for the design from a practical point of view, but it is needless going further into details. The various points mentioned will be seen from the drawings, which also give a general view of the protected conductor with its anchor, feeder terminal and ramp

Smoke from Road Locomotives. Manchester Health Committee have passed the following resolution:—"That in view of repeated complaints from inhabitants of the nuisance arising from the emission of smoke from light locomotives in the public streets, and the danger to health consequent thereon, and as existing legislation is inadequate to deal with same, this Council urges the Government to introduce fresh legislation with a view to giving local authorities adequate powers of preventing this nuisance."

The Rule of the Road.—As the result of experience gained during the war, French automobile drivers are stated to favour the British rule of the road, namely, to keep to the left. The importance of observing the recognised code of road signals in this country was recently emphasised by a Scotland Yard official. He remarked:—"The code of signals, although not passed by law, is now being recognised in police-courts as evidence of careful driving or otherwise. In a recent case a prosecution for careless driving was successful on the evidence that the driver had not put out his hand when taking a sudden turn off the main road. While a universal system of road rules would be advantageous, there are great difficulties for any country changing its laws of the road. It would mean in our case, for instance, that all omnibuses and tramway cars would have to change the position of their staircases."

HOW THE UNDERGROUND "CARRIED ON."

Celebration of the Volunteers' Triumph.

On Monday, October 6—the day following the settlement of the national railway strike—a gathering unprecedented in the history of traction in this country took place at Earl's Court. It was an assembly of many of the 5,000 volunteers and loyal employees of the London Underground Railways to celebrate the triumph of the citizens who came forward and got the Underground lines into operation. The occasion also served as a farewell of the management to the host of workers who had rendered service to the company and to the public. A few hours previously the vast hall had contained fittings which served to convert it into one of the largest hotels in England. The accommodation therein provided for the volunteers comprised many hundreds of beds, a full catering equipment, and means of recreation. In this triumph of organisation even the Publicity Department of the company had taken part by issuing two numbers of "Carry On," a news sheet for the instruction and edification of the voluntary workers and the loyal staff. The second issue was a souvenir number, of sixteen pages, giving a verbatim report of the reunion. It also contained sixteen illustrations, including a flashlight picture of the great meeting, and of Mr. Murray Griffith chaired by volunteer comrades. That gentleman, who is a director of the company, acted as a porter and captain of one of the hostelries.

As the report in "Carry On" observed, the keynote of the meeting "was the warmth of affection between the organisers and the volunteers, and this was the first opportunity to demonstrate the deep enjoyment of the staff in their self-imposed and heroic task of freeing London's prisoners of the pavement. The great hall with its rows and rows of bedding in the background resounded with tumultous cheering, finishing with the National Anthem and "Auld Lang Syne."

Mr. H. E. Blain's Review of a Notable Week.

Mr. H. E. Blain, the operating manager of the Underground Group, was enthusiastically received on ascending the platform with a group of directors and officials. He said:—There are some occasions when the English language has no words to express the desires of those who wish to voice appreciation; there are some occasions to which not the tongue of the business man but that of an orator is needed to do justice. What words can I find with which to say to you what is in my heart? There has probably never been an occasion in the history of this country, outside the great war, when we have had a more striking exhibition of the force of public opinion, and of the grit which is in the hearts of English-speaking men and women. (Applause.) May I just run over the incidents of the last eight days? At midnight on Friday last the strike began, but there were few even of those connected with railway management who thought that such a strike was going to ensue. On many of the main lines the trains were left as they stood, but I am happy to say that so far as our men who were striking were concerned, they took the cars into the depots and left with a clean sheet.

We awoke on the Saturday morning with the knowledge that the whole of the railway traffic of London had been paralysed, and you know what that means in this great capital. London looked to us to see that its means of communication were restored at the earliest possible moment. We on the management side made our plans that day, and on the following day (Sunday), by the assistance of the Automobile Association and other despatch riders, at 1.30 p.m. communications were sent out to 400 or 500 who had volunteered, and whose names were registered, to report to Electric Railway House at once. By 3 o'clock the first volunteers were streaming into Westminster Broadway. The first two were Majors Howell and Baddeley, formerly of the cavalry, and the first words they said were, "If you want the whole of the Cavalry Club you have only got to let us know and it will be here in ten minutes!" (Cheers.)

Volunteers at the Power Station.

From that time up to midnight volunteers were streaming in, and at midnight on Sunday, Mr. Knapp, the manager for maintenance and construction, had all his arrangements made, and the front of our building was completely filled with lorries and cars

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to transfer the first volunteers to the Lots Road power-house. (Cheers.) They arrived there shortly after midnight. There was a duly arranged posse of police in attendance. Those of the strikers who had remained to keep the pumps going were informed that it was the Government's instruction and the company's intention to start the London Underground system working; were they willing to do it, or not? The reply was in the negative. They were escorted to the door, and the volunteer gang set to work to run the power-house—a gang whose monetary value probably has never been precedented. (Applause.) On Monday we were overwhelmed with volunteers, and I tender now the management's apology to those who waited in a queue probably for an hour or two before allocation; but you will agree that as soon as it was possible an organisation for dealing with the long registers was set on foot. Had there been some necessary arrangements made for which we were not responsible we should have been in a position—and were in a position—on Monday afternoon to commence the operation of the District Railway and the Hampstead Tube. Both these railways were operated on the following day, and there has not been one day since without either one line or two lines being re-opened. The last of our lines—the City and South London Railway—was opened this morning by the voluntary workers (Applause.)

A good deal has been said in the Press about the aristocratic volunteers who have carried out their work so well, but this work of resuming London's traffic has not been due to any one class or any one grade. (Hear, hear.) Amongst the 5,000 voluntary workers there is every grade, from the House of Lords to every type of working man, and it is because of the co-operation of every class of London citizen that the magnificent work has been accomplished. It is to you all—to each individual man—that the company and the public are indebted. (Applause.)

We deemed it necessary in the interests of your comfort that as many as possible should be slept and fed with us—(a Voice: "And jolly well you did it, too!" Applause.)—and I want to say that if it had not been for the magnificent co-operation of my assistants in the catering section it would have been impossible to do what has been done during this week. (Cheers.)

Those men of the permanent staff who were loyal have done yeoman work, and their services will never be forgotten. (Applause.) The first step we took was to obtain the assurance issued by Government authority that the loyal men should not be "let down" by the strikers.

An Aladdin's Transformation Scene.

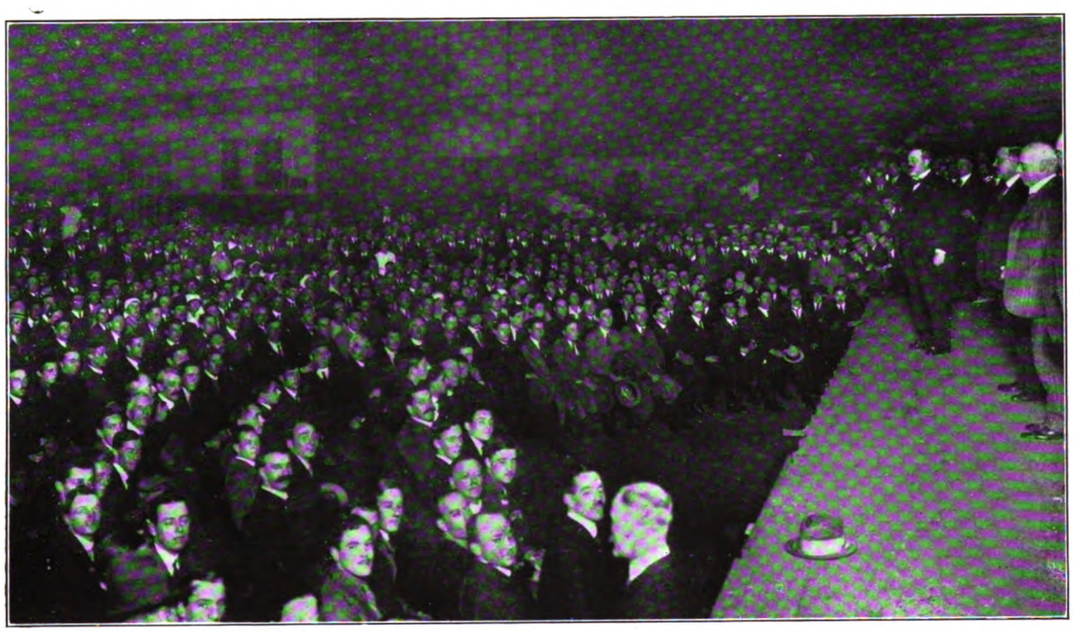
You will forgive me if I refer to one or two of the assistants who have been primarily responsible for the operating side. There is Mr. Thornton, of the District Railway. (Cheers.) I do not know whether he has slept during the last eight days, and I think there are very few of us who have. There is Mr. Trigg, of the Tube lines. (Cheers.) There are all the divisional inspectors who have taken charge of their lines when opened, and have done everything they could to assist in the comfort of the volunteer workers. There is Captain Rozier, the superintendent of employment and catering. (Applause.) The Underground Railways and the London General Omnibus Company have done a good many things during the war, for which I do not know that they have been fully recognised, but at any rate during this strike I think that there could have been no more efficient man in charge of a commissariat department than Captain Rozier. (Applause.) The work that he and his assistant, Mr. Rodway, and others have done at a moment's notice seems to me more like a process of getting Aladdin's lamp and rubbing it. I used to tell him in a morning that we wanted another 200 or 500 beds, and he rang me up in five minutes' time and said that his staff were tucking in the pillows! (Laughter.)

Then with regard to the training of motormen, we have had Mr. J. P. Thomas—(applause)—and Mr. J. Coole, of the District Railway. (Applause.) In five days there have been fully qualified for driving, and by no slovenly test either, for they had to pass the test that every motorman has to pass, over 100 men certified as proficient drivers and our total strength is only 500 in normal times. (Loud applause.) Then what are you going to say about the 900 ladies who volunteered as canteen workers? In your name and ours, I thank them. (Cheers.) Every volunteer worker has been booked up on the company's pay-roll for the full trade union rates, and the full overtime rate, for all the hours that he has put in. I hope that none will object to take that money. Those who do not need it know that there is St. Dunstan's and all sorts of good purposes to which they can put it (Applause.) To those who have passed as motormen, or in any skilled grade, we shall be pleased, if they care to have it, to furnish the full certificate of proficiency in that grade. (Shouts of "That's good.") We hope to send to every one of you a formal letter of thanks—I was going to say from the company, but I am going to alter that and say from the whole of the public of London, for the magnificent services that have been rendered. The motormen may be interested to know that the engineering department report that last week was the first week, at any rate for a very long time, that there was not a single burnt-out armature! (Applause.)

We shall also hope to send to you No. 2 of "Carry On." It would have been in your hands now but for the fact that we are desirous of making it a souvenir number, so that I hope you may deem it worthy of treasuring as a sweet and fragrant memory of all that you have been doing these last eight days. (Applause.)

Source of Inspiration.

No words of mine can express what we would desire to say to every man and woman who has been helping us. The civic spirit, the personal enthusiasm and determination have been magnificent. I was asked once or twice when I was round at a hostelry between 11 and 12 o'clock at night, how it was I found time to do it. It was because a visit to a hostelry was so much of an inspiration that without it I could not have gone on next day. (Hear, hear.) I hope that during this week I have enormously enlarged my circle of personal friends. It has been an honour and a pride to know you; it has been a delight to see the way in which the railways have been run—that cheery fellowship, that camaraderie which has struck the public with delight. I extend in the name of the people of London our grateful thanks to the volunteers of the Underground Railway, working during the railway strike of 1919. (Prolonged applause, and hearty singing of "For he's a jolly good fellow.")



Flash-light Photograph of the Meeting at Earl's Court.—Mr. H. E. Blain (Operating Manager) thanking the Volunteers.

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Major G. C. Hamilton, M P. (a volunteer motorman) said :— Mr. Blain started his speech by saying that he could not make a speech. I have listened to many, but seldom a better one! (Hear, hear.) I sincerely believe if our Prime Minister had been here, as I know he would like to have been, to have thanked us for what we have tried to do, he could not have made a finer speech than Mr. Blain has made. (Hear, hear.) Mr. Blain said that, although he was grateful to the Members of the House of Lords, and to Sir Richard Cooper, Mr. Baldwin Raper, and myself as Members of the House of Commons, we were only as one amongst the crowd who have been working in the interest of the public. Mr. Blain is right. When I joined I did not want to be known as a Member of Parliament, and I am thankful to say that no photographer managed to put me in the illustrated papers. (Laughter.) We have felt during this very serious week that we have met on the District Railway and on the Tubes a most charming set of English gentlemen, who have helped us to be useful. (Hear, hear.) My experience has been with Mr. Thornton, Mr. Coole, and Mr. Rogers. Their warnings prevented me from overrunning a single station! (Laughter.) Now that it is over let us go away with this feeling — that we have helped the Government (applause) who have had to face the risks of a national strike. If we had not helped we might have had all the transport workers and others out. The fact that the District Railway and the Tubes in London were able to give service has been a warning to the workers that Britishers are not to be beaten. The strikers will know, as we know, that their country to-day has passed through a second terribly difficult time, and, largely due to your patriotism, has passed through it with success, and I believe the Government have won the greatest victory over Bolshevism. (Applause.). We are all in favour of trade unionism, but not lightning strikes and attempts to hang up the community for political reasons. (Hear, hear.) On your behalf, I tender to Mr. Blain, and to those who helped us, our cordial thanks for the great courtesy, kindness, and hospitality they have given to us in helping us to aid them in helping us to help our country. (Cheers.)

The Work of the Company's Staff.

Sir Richard Cooper, Bart., M.P. (a volunteer signalman) said : — It affords me the greatest pleasure to second a vote of thanks to Mr. Blain and to the staff of the Underground Railways for the expression of thanks which Mr. Blain conveyed to you. I am speaking, Mr. Blain, for the volunteers. We appreciate your words, but every one was actuated by a desire to do something to help our country and to protect the great mass of British people. (Hear, hear.) It has been a very happy week for every one of us. (Hear, hear.)

Mr. Murray Griffith (a volunteer porter and "Captain" of one of the hostelries).—It would be idle on my part, after the inspiring speeches that we have heard, to waste your time. I have spent one of the most pleasant weeks of my life, not because we were endeavouring to do anybody out of work, but because we were helping those who could not help themselves.

Mr. Blain.—Mr. Trigg unfortunately is not here, but on behalf of the quintette I desire to thank you for your reception. There are two things I want to add. First, you will break the hearts of all those pretty ladies if you do not have tea with them, during which time we are going to distribute on the tables these little forms, which you will kindly sign as a receipt for wages.

Mr. J. P. Thomas.—In the first place I should remind you that I am J. P. Thomas, and not J. H. (Laughter.) You conferred upon me a great honour by the assiduous way in which you accepted instruction in driving, which I have had the pleasure of giving you. We have come across some marvellous material. We have marine engineers, aeronautical engineers, drivers from Australia, drivers from Canada, and a regular medley of first-class material. I got landed in this strike. I happened to be at Aysgarth, Yorkshire, and it took me three days to get here, but many friends came to my assistance, and helped me in training the men. I have done very little myself—I have simply asked others to do it for me, and they have not failed me. I want to mention the names of three or four people. First we have Mr. Sumner from the B.T.H. Company at Rugby. Mr. Sumner had trained the North Eastern Railway drivers, the Central London drivers, and the drivers of the Great Northern and City Railway, and has now been helping in this crisis. Then Mr. Sargent who arrived a few hours after being telegraphed for. He served just in the same way as Mr. Sumner; and I want to thank specially Mr. Ruane, of the Westinghouse Brake Company. He also came within a few hours of request. Perhaps there is no greater expert in this country on the brake question than Mr. Ruane, and the drivers who have passed out and those in training are highly privileged to have heard about the technicalities of the Westinghouse brake from such an expert. Others, whose names are almost too numerous to mention, have formed the basis of the training, and over 100 drivers have been passed out in five days. The examination has been precisely the same as for the regular motormen less one or two minor details, and the volunteers have shown amazing keenness. We were prepared to turn out over 30 per day up to 500, and should not have failed to have done that in about ten more days.

Staff's Friendly Feelings Towards Labour.

One regrets that we have had this strike; one regrets that we are not on more friendly terms with our own staff. I am sure that no one regrets that more than the management of the Underground. We would have the men nearer to us than they are to-day. We try to avoid these troubles to the best of our ability, but somehow we get discouraged and we fail to accomplish the object. In the first autumn of a non-Prussian world may we see the birth of industrial peace, and by the end of this year may we ourselves and other great employers be on more friendly terms than we are to-day, and strikes made more remote. (Applause.)

Chief Inspector J. Thornton (District Railway) and Mr. J. Coole also replied.

Captain A. Rozier.— I desire to thank you for the appreciation you showed when my name was mentioned in connection with the catering section, and my staff are grateful for the appreciation you have shown and the very few complaints we have had in connection with the food or the bedding, and the way in which we have tried to make you comfortable. It has been no easy task. We started with nothing, but on Friday evening we had accommodation for 1,000 people, and were in a position to feed, if necessary, 2,000. That could not have been accomplished without the great assistance which we had from everyone connected with the Earl's Court ground, and the lady volunteers.

THE VOLUNTEERS IN THE ENGINEERING DEPARTMENT.

Owing to the fact that the voluntary workers at the Lots Road Power-house did not conclude their services until late on the Monday night, and that the others were scattered about the lines, it was not possible to arrange for them a farewell meeting of thanks, but a number were able to get to the great operating meeting at Earl's Court. Mr. Z. E. Knapp, the manager for maintenance and construction, desires to express his gratitude and appreciation for the work so magnificently carried out on the engineering side. The volunteers who worked the Lots Road and Wood Lane power-houses and the various sub-stations, and who gave such valuable technical aid, on the signalling system, in the examination of cars, and the maintenance of the permanent way, rendered assistance without which it would have been impossible to attempt to operate the railways. They responded with skill, alacrity, and the utmost willingness to every call made upon them, and no words of appreciation can adequately express the indebtedness of the company and the public to them. Consulting and professional engineers cheerfully placed themselves at disposal for any work assigned to them, and the stokers made a happiness and a joy of their monotonous and arduous toil. Messrs. A. R. Cooper, W. A. Agnew, P V. McMahon, J. H. Millen, G. W. Cruickshank, and A. R. McCallum worked literally day and night in their successful efforts to ensure that the engineering details were maintained safe and sound for public traffic.

DIARY OF VOLUNTEERS' SERVICE.

Friday, September 26 (midnight).—National railway strike. All Underground lines stopped.

Saturday, September 27.—Re-organisation of plans.

Sunday, September 28 (1.30 p.m.).—First call-up of volunteers (Midnight).—Lots Road power-house manned.

Monday, September 29.—Training of volunteers on District Railway and Hampstead Tube.

Tuesday, September 30.—District Railway opened between Hammersmith and Mansion House. Hampstead Tube opened between Charing Cross and Hampstead, extended later to Golders Green. Wood Lane power-house manned. Total volunteers enrolled, 1,500.

Wednesday, October 1.—Central London Railway opened between Liverpool Street and Shepherd's Bush, extended later to Wood Lane. Total volunteers enrolled, 3,000.

Thursday, October 2.—District Railway working extended to Aldgate East. Piccadilly Tube opened between Hammersmith and Finsbury Park. Total volunteers enrolled, 3,700.

Friday, October 3.—District Railway working extended to Ealing Broadway. Total volunteers enrolled, 4,300.

Saturday, October 4.—Bakerloo Tube opened between Elephant and Castle and Paddington. Highgate Tube opened between Highgate and Charing Cross.

Sunday, October 5.—Sunday service run on all above railways.

Monday, October 6.—City and South London Railway opened between Moorgate Street and Clapham Common. Total volunteers enrolled, over 5,000. Great meeting of triumph and farewell.

Motor Cars Replace a Railway.—A report from Ludington, Michigan, states that motor truck transportation has put the passenger division of the Ludington and Northern Railroad out of business. J. S. Stearns, principal owner, has contracted with Epworth and Hanlin to furnish automotive transportation from trains and boats to the resorts for the next two years, in return for co-operation in asking the Michigan Public Utilities Commission to enter an order permitting the rails to be removed.

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THE EDITOR will be glad to consider articles by experts. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, NOVEMBER 13, 1919.

Omnibuses and the Road Question.

Some years ago textile manufacturers were delighted by the discovery that a plant named ramie, growing wild in large tracts of tropical and semi-tropical countries, offered a vast supply of a fibre which could be spun and woven into various kinds of fabrics. But the joy of the discovery was tempered when the nature-grown fibre showed itself to be irregular and unreliable in quality, and the glad anticipations were turned to regret by the practical fact that, after the wild supply had been exhausted and cultivation was necessary for continued supply of the fibre, the cost would be out of all proportion higher than the value of the material. A lesson somewhat similar in character seems to be awaiting those who are tempted to pin their faith on the motor omnibus too exclusively. The omnibus owner finds the roads ready made, and he has no expense preliminary to starting running. A tramway undertaking, on the other hand, is required to expend on track alone an average of, say, roughly, £20,000 per mile before a single car can be put into service. Also power-stations have to be built, electrical equipment installed, and costly cars provided. Happy in his free roads, light vehicle, and petrol can, the motor omnibus man goes gleefully on his way. Of late, however, the omnibus owner's jubilation has received a severe check by the demands of road authorities for contributions to road maintenance which are constantly being raised. Road authorities are finding, indeed, that they have hitherto totally under-estimated the road-destroying capacity of the omnibus, and it is questionable at the present moment if, with one or two possible exceptions, any road authority makes a charge per mile sufficient to repay the damage caused by the omnibus. The free asset of the omnibuses in publicly maintained roads is nearly exhausted, and they will sooner or later have to share the burden of maintaining the permanent way, which is as necessary for them as the track is for the tramway car. Like the textile manufacturers in the case of ramie, they will probably find that road-making is more costly than track-making. Ultimately it is a very simple question. Ignoring minor modifying factors for the sake of clearness, it is evident that equal loads in tramcar and omnibus must exert the same amount of wear and tear upon the surfaces upon which they run. The other day a sapient town councillor proposed that the omnibuses should be enlarged so as to equal the tramcars in carrying capacity. Omnibus owners must have felt uneasy at the proposal, because if carried out it would give their case away entirely. An omnibus with the carrying capacity of a standard tramcar would reduce to ruins the best-made roads within a week, if the traffic were constant. Sir Arthur Stanley years ago put the case pointedly when, in his epigrammatic way, he said that he had yet to learn of a more economical mode of traction than a metal wheel upon a metal rail. A tramway track is costly to make, but it endures for years the constant wear and tear of heavy passenger traffic. To maintain roads under a traffic of equal intensity would entail an expenditure compared with which the cost and maintenance of tramway track is a trifle. Again, comparison has been suggested between the tramcar and the omnibus as a passenger-carrying vehicle, both in regard to lasting quality and convenience. Here, also, the question is quite simple. Can the omnibus carry the same number of passengers as the tramcar at less cost

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in maintenance and renewal of the vehicle? A tramcar costs, say, a third as much again as the present form of omnibus in use, but it carries double the number of passengers, and lasts three or four times as long. The tramcar may not be the last word in passenger-carrying vehicles for public street service, but it certainly seems to come out an easy first in comparison with the omnibus. Lastly, the question whether the internal combustion engine consuming petrol or electric power is the more efficient and economical remains to be considered. The present abnormal conditions offer no sound basis of comparison; but it is well known that petrol will never go back to pre-war prices, and the future of the world supply is vague and uncertain. In brief, comparison of the omnibus with the tramway, as has before been urged in these columns, would be wisely abandoned for the more useful inquiry into the best ways of using both.

The Transport Institute.

All forms of traction stand to benefit from the decision to inaugurate an Institute of Transport for the study of questions relating to traffic and transport. On the essential unity of all branches of land transport we have often insisted; but until the far-sighted proposals of the Government for the establishment of a Ministry of Transport were adopted there was more insistence on the diversity than the unity of the various departments. In transport, as in many other spheres of activity, the views of men are broadening, and the railway man, the tramway man, and the motor omnibus devotee are coming into some sort of harmony with one another as they recognise that all are concerned in a great national industry with which the development and progress of the country are indissolubly bound up. The time is therefore ripe for the formation of an organisation that will include within its membership representatives of all branches of transport. Although the suggestion of a railway institute had been made on more than one occasion, the proposal to include other branches of traction interests was first made some months ago by our contemporary, *Modern Traction*. Mr. H. H. Gordon, of the Highways Committee of the London County Council, and others then took up the matter. A small committee was formed, and a scheme for the formation of the institute was drafted. At the invitation of Sir Albert Stanley a representative gathering of transport experts met at luncheon on November 3, when Sir Albert, in a convincing address, set out the reasons that existed for the formation of the proposed Institute. Influential representatives of railways, tramways, and motor traction strongly supported the chairman's views. By a unanimous vote it was decided to proceed with the establishment of the Institute, and a committee was appointed to make the necessary preliminary arrangements. With the influential support already enlisted in the enterprise there can be little doubt that success will be quickly attained, and that the Institute will become an important factor in the industry.

London County Council's Tramway Plans.

Elsewhere particulars are given of the tramway scheme for which the London County Council propose to seek powers in the next session of Parliament. Projects to cost over four million pounds are included. More than half of the proposed lines are required for linking up the southern and the northern sections of the Council's undertaking and for relieving congested centres. In many cases these improvements are long overdue; they have been blocked by opposition in former Councils or in Parliament. Now the need is clamant, and the great majority of the Council recognise, as do the people of London, that delay is no longer possible. There will, of course, be a strenuous contest in Parliament; for the opposition is already being organised by various people who do not wish to use the tramways, and would indeed, if they could have their way, abolish them entirely. But it is not unreasonable to hope that Parliament will take into view the interests of the general public, who need the facilities that the Council now propose to give them. If there were any other means of street transport as cheap as the tramway car, the arguments of those who oppose tramway extensions might be of more weight, for no one contends that tramways are an ideal system. In the present economic conditions, which will moreover persist for years, it is, however,

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imperative that the public should be given the cheapest form of transport. As Mr. G. H. Hume, who for years did such excellent service as chairman of the Highways Committee, said at the Council meeting, when the new proposals were debated, "So long as the working population had to be taken from the centre of London, fixed rail traction would be indispensable." There is, in fact, no other practicable method by which the work can be done; and the Council has done no more than its plain duty in calling upon Parliament to provide it with the necessary powers to carry out the plans that its advisers consider to be necessary in order that they may be enabled to meet the public demands. Not only are the proposed lines required to cope with the traffic, but they will greatly aid the Council to meet the enormously enhanced cost of working the lines already constructed. Increased wages and the higher cost of materials make it essential that the entire system should be made more efficient and publicly useful. This can only be done by a courageous policy of development. The rush traffic of London has steadily increased, and the means for dealing with it to-day are insufficient. Upon those who oppose the Council's plans to meet the urgent need must rest the burden of showing how otherwise a remedy can be provided.

KEIGHLEY'S RAILLESS CAR SCHEME.

COUNTY COUNCIL'S VETO PERSISTED IN.

The Keighley Corporation appealed to the Ministry of Health against the refusal of the West Riding County Council to consent to the Corporation running a new trackless trolley route along the main road between Keighley and Oxenhope.

The County Council were able to substantiate their refusal, the Ministry deciding that the consent was not unreasonably refused. At the same time they suggested that there would be an advantage if an opportunity were given to the Town Council to test the amount of traffic upon the route, and that the County Council should take the matter into consideration with a view to an arrangement being arrived at by which the Corporation might be able to run an experimental service.

In this connection the Highways Committee of the County Council now report that on the hearing of the appeal the Corporation, whilst calling several witnesses, failed to set up any case of public necessity or demand for the service, and in these circumstances the committee do not feel that the County Council would be justified in acceding to the suggestion of the Ministry of Health. The committee adds that it considers that the use of materials and labour, urgently required elsewhere for actual needs, for experimental purposes of this kind would be unwarrantable. The committee would, of course, reconsider the matter when a change of conditions renders it opportune.

Fogmen for London Omnibus Services.—The London General Omnibus Company have arranged to place on the London streets a specially trained staff of fogmen, who will be on duty in time of fog both day and night. A commencement is to be made at thirty-four of the busiest traffic points. These fogmen will be equipped with lamps to signal and guide the omnibuses at the busiest traffic centres.

CORRUGATION AND THE SANDBERG RAIL TREATMENT.

To the Editor of THE TRAMWAY AND RAILWAY WORLD.

SIR,—In an article in THE TRAMWAY AND RAILWAY WORLD for September (page 139) on the Sandberg "in situ" treatment, reference is made to the causes of corrugation and high appreciation is deservedly shown of the work and attainments of my many years' friend, the late Mr. Stephen Sellon. You mention that he held that corrugations were due to cold rolling of the metal in the rail tread.

You also refer to Mr. G. E. Pellissier as having advanced the theory in 1911 that corrugations only occur when the pressure at the point of maximum intensity exceeds the elastic limit of the steel at that point.

As the origin and production of corrugation has for a long time occupied my attention, perhaps you will allow me to remind your readers that causes of corrugation as thus appealed to were fully set forth and published by me in a paper read before the British Association at the Leicester meeting in 1907, and in a further paper on the subject with experimental results read before the British Association in 1911. The origin of corrugation was the subject of a paper—Inst. Civ. Eng., Vol. CXCVII. (1914)—by Mr. Sellon, and in that paper and in the discussion upon it my earlier enunciations of the cause of corrugation were set forth.

After five years of experimental observations of the rails in the Kingsway tunnel of the London County Council Tramways, the rail corrugation sub-committee No. 1 of the Municipal Tramways Association, of which I was chairman, have adopted the explanation of corrugation which was given in the papers above mentioned of 1907 and 1911 by

Yours truly,
W. WORBY BEAUMONT.

222, Strand, W.C.2,
Oct. 2, 1919.

ELECTRIFICATION ON THE NORTH EASTERN RAILWAY.

The Directors of the North Eastern Railway have provisionally sanctioned a scheme for the electrification of the main line between York and Newcastle, a distance of 80 miles. It is also proposed to electrify the loop line from Northallerton through Eaglescliffe and Stockton to Ferryhill, a length of 31 miles. The details have been worked out by Sir Vincent Raven, chief mechanical engineer of the North Eastern Railway, and Messrs. Merz and McLellan, consulting electrical engineers to the railway.

The new plans provide for a combination of the third rail and the overhead systems, the general idea being that the former should be used on the running lines and the latter in the goods yards and at the large stations. The third rail will be fully protected, and the installation will be in every way suitable for high speed service. All the trains will be hauled by locomotives, but the type has not yet been finally selected.

Charing Cross Underground Station.—A new subway is being constructed with the object of avoiding the congestion which now takes place in the circulating areas at the top of the escalators and on the eastbound platform at the foot of the exit stairs (west end). The new subway will be reached by stairs leading thereto from the two "District" platforms, and will be used for passengers going from the District platforms or the street to the tubes; the existing stairs, which now carry traffic in both directions, will be retained for outgoing passengers only. A new exit from the District westbound platform is also proposed. This will be formed by a new stairway from the platform, almost exactly similar to that on the eastbound side. A new footbridge immediately to the west of the station buildings and at street level will be provided, with an exit on the Embankment.

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THE INSTITUTE OF TRANSPORT.

On November 3 a gathering representative of transport interests met at luncheon at the Savoy Hotel at the invitation of the Right Hon. Sir Albert Stanley, M.P., and decided to form an Institute of Transport. Sir Albert Stanley presided, and among those present were the following—

MINISTRY OF TRANSPORT.

Sir John Aspinall, Sir Chas. Bartolomé, Sir Geo. Beharrell, Sir Francis Dunnell, Sir Alexander Gibb, Sir Philip Nash, Sir Wm. Marwood, Sir Henry Maybury.

RAILWAYS.

C. Aldington (G.W.R.), W. M. Acworth, H. E. Blain (Underground), Sir Sam Fay (G.C.R.), L. W. Horne (L. and N.W.R.), R. H. Selbie (Met. Rly.), Sir Herbert Walker (L. and S.W.R.), Sir I. T. Williams (L. and N.W.R.).

TRAMWAYS.

Municipal—Sir J. Courtis (Cardiff), A. R. Fearnley (Sheffield), A. L. C. Fell (L.C.C.), H. H. Gordon (L.C.C.), T. B. Goodyer (Croydon), J. M. McElroy (Manchester).

Company—The Hon. Sir Arthur Stanley, G.B.E., J. Devonshire (London and Suburban), E. H. Edwardes (South Lancashire), H. England (Wakefield), R. J. Howley (B.E.F.).

ROAD BOARD.

Sir George Gibb.

INLAND WATERWAYS.

Sir Maurice Fitzmaurice.

PORT OF LONDON AUTHORITY.

Sir J. Broodbank.

MOTOR, ETC., PASSENGER AND GOODS TRANSPORT.

Mr. H. Dutfield, Sir W. Joynson-Hicks, Bart., M.P., S. E. Garcke, E. S. Shrapnell-Smith, H. C. B. Underdown, W. Wolsey, jun.

OTHER INTERESTS.

Sir Evan Jones, M.P., Sir Lynden Macassey, R. Burton Chadwick, M.P., Col. T. H. Minshall, F. C. Colman, W. E. Freir, J. A. Kay, Chas. Travis, A. M. Willcox.

Apologies regretting inability to attend had been received from:—A. Baker (Birmingham Tramways), Sir A. Kaye Butterworth (N.E.R.), Sir Francis Dent (S.E. and C.R., on the Continent), C. H. Dent, (G.N.R.) J. Dalrymple (Glasgow Tramways), Sir Wm. Forbes (L.B. and S.C.R.), J. B. Hamilton (Leeds Tramways), who wrote:—"I am very strongly in sympathy with the general idea of such an institute, and I am also strongly in agreement with the resolutions which are proposed to be put before the Executive Committee, and the Articles and Memorandum of Association"; C. H. Merz, A. Tatlow (Mid. R.), who wrote that he would not be in London, but "shall, however, be pleased to become a member of the Institute in the event of it being formed, and would like to know the result of the meeting;" Sir Henry Thornton (G.E.R., out of town); A. Watson (L. and Y.R.), not in London, wrote:—"is entirely in sympathy, because he considers that an Institute of this character is needed. He would be glad to become a member if the Institution is formed;" H. A. Watson (N.E.R.), "is thoroughly in sympathy with the movement." Mr. J. Dalrymple (Glasgow) telegraphed his regret that he would not be in town.

In opening the proceedings, the chairman expressed his pleasure in welcoming representatives of the Ministry of Transport. It was very gratifying so many representatives of that department were present, and thus gave evidence of their desire to be in the forefront of any new scheme which would be beneficial to the interests of transport in this country. Sir Albert disclaimed credit for having first conceived the idea that there was need for an Institute of Transport. It was, he said, within the recollection of some of them that Mr. Gordon, of the London County Council, first wrote a letter which was published in *Modern Transport*. Subsequently at the invitation of Sir Francis Dent, a small committee was formed, and drafted a scheme providing for the incorporation of an institute. That committee had made their report, and a copy of their draft form of incorporation had been distributed. There were all sorts of institutes, but an Institute of Transport had never been formed, and it seemed strange that those men who were identified with transport, and were carrying on great traffic affairs, had not seen fit to form themselves into an organisation where these very important matters could be discussed. Transport was a business that required a very considerable degree of training, much experience, and great skill. It was, in fact, a great profession, and everybody identified with it could be proud of their association with it. It was a remarkable thing that they rarely found any man who had once entered the field of transit who got out of it. There was a fascination in the business that held men as no other industry that he knew was capable of doing. Men engaged in transport had a great responsibility which was different from that of any other form of industry. He did not say that every form of transport was in itself a monopoly, but it came close to it, and he thought a district or country was better served by having a monopoly than if it were served by an unnecessary amount of competition. It was because of the fact that the business must be in the nature of a monopoly that a peculiar responsibility rested on those who were carrying on these great undertakings. If they were going to be successful in these undertakings they must do two things; they must give the fullest publicity to all they did, and they must have the full knowledge of the responsibility of what that position meant. They must secure to the district they served the most efficient modern and effective form of transport that could be given. That was the burden that lay upon those who were carrying on these great undertakings. There was plenty of information available about all forms of transport, but the difficulty was to get hold of it. He was sure that everyone in the transport industry would be willing that the knowledge thay had acquired and the experience they had gained should be open to other people. In his own case they had found it necessary to send men to America to study the whole situation, and to let them have the benefit of what they had been able to find out. They had gone further; they had established in the United States an agency, the object of which was to secure for them week by week, as great problems of transit developed in that country, information as soon as it was available. In this country we had plenty of men capable through proper training to take hold of different undertakings. The difficulty was to find the latent talent, and to bring it out. One of the objects of the Institute would be to secure opportunities for those who desired to become identified with the profession to show their ability. There was never a more opportune time for the establishment of an Institute of this kind than now. Whatever they had been able to accomplish in the past, they had to accomplish a great deal more in the future. High wages and high costs would force them to make their organisations efficient. He thought they were on the threshhold of a great change in the form of transit in this country, and it was satisfactory to know that it had at last been recognised by the Government, and that a great department of the State had been set up with the object of securing the very best form of transport available. He welcomed completely the suggestion that an Institute of Transport should be formed. Speaking for Mr. Blain and all his associates, he could say it would have their unswerving encouragement and support, and he believed that it would secure more for this country than any institute which had been formed up to the present time, and because of his belief in it he had pleasure in moving a resolution that in the opinion of those present it was desirable that an institute be formed for the scientific study of questions relating to traffic and transport.

Mr. H. H. GORDON, London County Council, in seconding the resolution, thanked the chairman for his hospitality, which had enabled them to meet that afternoon to discuss a question which was fraught with the utmost consequences for good for the future of the country. The prosperity of one form of traction was largely associated with the prosperity of all forms. Shortly before the war, in making a tour of the Continent to study traffic conditions, he found in Berlin a magnificent traffic museum and another in Buda Pest. For the scientific study of traffic questions he found that one must go either to the Continent or to the United States. Nothing was more valuable than that men who had large experience in traffic work should have the opportunity of meeting to exchange views, to learn by each other's mistakes and to profit by each other's example. He thought that the Institute of Transport would become one of the most necessary of institutions, and that by its practical example it would influence the course of traffic development and confer good on the community.

The Hon. Sir ARTHUR STANLEY, in supporting the resolution as chairman of the Tramways and Light Railways Association, said that he thought they were all convinced that an institute of the kind was eminently desirable. On behalf of his tramway friends, he might say they were heartily in sympathy with the idea, and would do their utmost to help it to success.

Sir PHILIP NASH, Director General of Traffic at the Ministry of Transport, said that it was with a feeling that they were on the right line that they supported the proposal that Sir Albert Stanley had put forward. He felt himself that an institution of the kind was of the greatest necessity. Speaking not merely as a mechanical engineer who had spent the whole of his life in traffic, but particularly as one who had had experience outside England, where they always felt themselves somewhat cut off from developments of the kind in this country, he could speak on behalf of those who were similarly placed when he said that an Institute of Transport would receive the greatest support from British engineers abroad. He hoped there would be no delay in bringing the institution into being. His experience showed him that there would be a very great need, so far as the Ministry of Transport was concerned, for an exchange of views. It was only the other day that a man came to him with a particular difficulty, and told him that for three years he had been trying to persuade one of the big institutions to allow him to read a paper on the subject, and this showed the difficulty there had been in the past in finding room in the programme of those institutions for matters which were related just to movement.

Sir HERBERT WALKER, general manager of the London and South Western Railway, said he had always felt that in this country we wanted some institution for the training of traffic officers. The main object of a railway was to sell transportation. Functions of a civil or mechanical engineer were secondary only in importance to those of a traffic officer of a railway. He was the man who had to get out the whole scheme of transportation, and there was no means to-day of educating the traffic officer or the young men who wanted to gain experience in transportation problems.

Sir W. JOYNSON HICKS, Bart., M.P., supported the proposal on behalf of the road industry. He thought the old highway, the King's highway, had more to gain from the Institute of Transport than any other form of locomotion. If there had been an Institute of Transport in earlier days, the necessary data in regard to the improvements of roads would have been ready for any road engineer to-day. The motor itself would gain very largely from the Institute of Transport.

Mr. R. BURTON CHADWICK, M.P., thought that an Institute of Transport in this country would lead to a world-wide study of transport questions. It would be a fine, a patriotic conception,

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and from what he had heard that day, he thought it would have splendid support from its earliest stages.

Sir SAM FAY, general manager of the Great Central Railway, said that if they had had an Institute of Transport many years ago, he thought that many of them who were now getting on in transport work would not have wasted so much time. He could not conceive that any man connected with railways would not be helped by such training or such assistance as he would get from the Institute of Transport. If the Institute was to be successful it must be thoroughly democratic, and seek not only those who were engaged in the general offices and the general transport agencies, but get down to the rank and file. He thought that if the Institute was thoroughly developed on democratic lines the railwaymen of the future would bless the day when the Institute was inaugurated.

Sir GEORGE GIBB, President of the Road Board, said it was very gratifying to see the change in opinion as to the scientific study of questions of traffic and transport. He believed that the basis of the movement was a firm belief that practical results of great improvements could be achieved by treating transport as a science having its own peculiar problems. By the organisation of an institute means would be provided of getting the necessary knowledge, training, and study which were essential for the successful performance of their duties.

A resolution to form the Institute of Transport was then carried unanimously.

Sir ALBERT STANLEY then moved that an invitation be extended to the Right Hon. Sir Eric Geddes, Minister of Transport, to become the first president, and this was agreed to with loud applause.

A provisional committee of ten members of the following was then appointed:—Two members of the Ministry of Transport, Sir Sam Fay, Sir Francis Dent, Mr. H. H. Gordon, Sir Maurice Fitzmaurice, Sir Joseph Broodbank, Sir W. Joynson-Hicks, M.P., and Mr. H. Dutfield, with Sir Albert Stanley, M.P., as chairman.

THE NEW ERA OF TRANSPORT.

SIR E. GEDDES ON THE VALUE OF STATISTICAL KNOWLEDGE.

Presiding on October 23 at a lecture by Mr. W. M. Acworth on "Railway Professional Education" at the London School of Economics, Sir Eric Geddes, Minister of Transport, said that practical experience, as well as scientific education, was necessary. This country was behindhand in transport, but he believed that was due to the fact that they had taken on their back all the faults of the early days of the system. He urged them to look at the transport movement as a whole. They could, indeed, get the best economic value only in one way, and that was by statistical knowledge, which was the throttle valve of all progress and efficiency. Statistical knowledge imparted would dispel the distrust which existed between the traders and the companies and the companies and their men. He would consider that he had failed if, at the end of the two years allowed under the Transport Ministry Act, he had not arranged in some way to dispel the root of this distrust. Continuing, Sir Eric observed that we stood at the threshold of a great change in transport in this country, partly due to the lessons of the war. Earl Haig summed up the idea when he urged that we must have men, munitions, and movement, and now the last named was going to have intense attention. Indeed, among the belligerents the British earned a great reputation for their ability to run railways in France, and that reputation was to be reflected in the time of peace.

Sir A. Geddes, President of the Board of Trade, addressing a meeting of the Iron and Steel Exchange, stated that the Government were developing a great transport policy. No Government in the past had thought out what transport meant to an industrialised country and what transport could do, but they had now got a machine established in the Ministry of Transport, which would be able to think out and give effect to a complete transport policy which would have an enormous effect upon industry. If the great trades would co-operate it would be the greatest possible help to them in the development of their industries.

LONDON TRAMWAY APPOINTMENTS.

The London County Council in 1917 adopted a scheme for the reorganisation of the tramways department on a comprehensive basis. This scheme has since been amplified, and the Highways Committee recently issued advertisements inviting applications for the undermentioned positions. The salaries named are based on pre-war conditions, and are subject to temporary war allowances in each case—

(1) Rolling stock engineer (£1,000 to £1,200 a year);
(2) Permanent way engineer (£800 to £1,000 a year);
(3) Assistant electrical engineer (£600 to £800 a year);
(4) Traffic operation superintendent (£600 to £800 a year);
(5) Traffic statistics assistant (£300 to £400 a year); and
(6) Sub-station superintendents (two, £250 to £300 a year).

For the position of permanent way engineer 42 applications were received, but the Highways Committee recommended that for the present the existing arrangements should be continued, whereby Mr. J. B. Welling acts as permanent way engineer at a salary of £750 a year.

For the other positions a number of applications were received, and the committee interviewed the six candidates considered most suitable for each position. The following candidates were placed on a short list:—

ROLLING STOCK ENGINEER.—Captain E. H. Cockshott, assistant to manager for maintenance and construction and technical engineer, London Electric Railway Company, Limited; Mr. W. E. Ireland, acting rolling stock engineer, London County Council Tramways; Mr. T. Ridyard, rolling stock and works superintendent, Liverpool Corporation Tramways.

ASSISTANT ELECTRICAL ENGINEER.—Mr. G. D. Meynell, assistant engineer, Victoria Falls and Transvaal Power Company; Mr. R. W. Willis, principal assistant to Mr. C. H. Wordingham, consulting engineer; Mr. W. Yorke, deputy electrical engineer to British Cellulose Company.

TRAFFIC OPERATION SUPERINTENDENT.—Mr. S. R. Geary, divisional traffic superintendent, London County Council Tramways; Mr. W. J. McCombe, late manager, Hull Corporation Tramways; Mr. W. H. Stradling, assistant manager, Bristol Tramways and Carriage Company, Limited.

TRAFFIC STATISTICS ASSISTANT.—Mr. C. G. Parker, first class assistant, valuer's department (previously in local government and statistical department); Mr. G. Potter, assistant, traffic branch London County Council Tramways; Mr. F. Scothorne, first class assistant, valuer's department (previously in local government and statistical department).

On the recommendation of the Highways Committee, the following promotions and appointments were made—

Mr. W. E. IRELAND promoted to be rolling stock engineer at a salary of £1,000 a year, rising by annual increments of £50 to a maximum of £1,200 a year, together with temporary war allowances of 10 per cent., plus £80 a year.

Mr. R. W. WILLIS, assistant electrical engineer at a salary of £600, rising by annual increments of £25 to £700, and thence by two annual increments of £50 to a maximum of £800, with temporary war allowances of 20 per cent., plus £90 a year.

Mr. S. R. Geary, promoted to be traffic operation superintendent at a salary of £600 a year, rising by annual increments of £50 to a maximum of £800 a year, with temporary war allowances of 15 per cent. on a salary of less than £800 a year and 10 per cent. on £800 a year, and a war bonus varying from £62 10s. a year to £80 a year, according to salary.

Mr. FREDERICK SCOTHORNE, transferred and appointed traffic statistics assistant at a salary of £300 a year, rising by annual increments of £25 to a maximum of £400 a year, together with a temporary war allowance of 20 per cent. and war bonus of £70 to £73 a year.

Mr. H. H. BULLOCK and Mr. H. J. MORRIS, sub-station superintendents at a salary of £250 a year, rising by annual increments of £12 10s. a year to a maximum of £300 a year, together with temporary war allowances of 20 per cent., plus £90 a year.

Mr. W. W. J. STUDD, publicity assistant in the London County Council Tramway department, at a salary of £300, rising by annual increments of £25 to £400 per annum, with a temporary war allowance of 20 per cent., plus a war bonus of £70 per annum. The appointment is probationary for six months.

UNDERGROUND RAILWAY AND LONDON GENERAL OMNIBUS APPOINTMENTS.

A number of changes in the organisation of the operating department of the Underground Railways and London General Omnibus Company, Limited, have been announced by the management of those companies—

Mr. J. P. THOMAS has been appointed assistant operating manager of the railways and omnibuses.

Captain A. ROZIER has been appointed general superintendent of the London General Omnibus Company, Limited.

Mr. J. THORNTON becomes superintendent of the line to the District and Tube Railways, in place of Mr. W. E. Blake, deceased. For the past fourteen years Mr. Thornton, the new superintendent, has been chief inspector of the District Railway. He started life when a youth in the goods department of the Caledonian Railway, under Superintendent Harvey, at Lothian Road, Edinburgh. Later he undertook service in various grades with the North British Railway, Glasgow District Subways, Central London, and Great Northern and City Railways, before he eventually joined the staff of the Underground.

Extension of Time for Tramway Construction.—The Board of Trade has granted a year's extension of time to Balfour, Beatty and Company, Limited, for the completion of a tramway between the terminus at Stone and the Gravesend system.

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MINISTRY OF TRANSPORT ACT, 1919

FULL TEXT OF THE MEASURE

ARRANGEMENT OF SECTIONS.

1. Appointment of Minister of Transport.
2. Powers and duties.
3. Power to control temporarily railways, etc.
4. Saving for statutory harbour, dock and pier authorities.
5. Power to grant through-runnings on tramways.
6. Power to retain lands, etc.
7. Provisions as to officers and servants.
8. Claims against and by the Minister in respect of exercise of powers.
9. Power to establish transport services.
10. Extraordinary traffic.
11. Appeal as to bridges.
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SCHEDULES.

An Act to establish a Ministry of Transport and for purposes connected therewith.

BE it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows—

APPOINTMENT OF MINISTER OF TRANSPORT.

1. For the purpose of improving the means of, and the facilities for, locomotion and transport, it shall be lawful for His Majesty to appoint a Minister of Transport (hereinafter referred to as the Minister), who shall hold office during His Majesty's pleasure.

POWERS AND DUTIES.

2.—(1) It shall be the duty of the Minister in the exercise and performance of any powers and duties transferred to, or conferred or imposed upon, him by or in pursuance of this Act, to take steps to carry out the purposes aforesaid, and there shall, as from such date or dates as His Majesty in Council may by Order determine, be transferred to the Minister all powers and duties of any Government Department in relation to—

(*a*) railways;
(*b*) light railways;
(*c*) tramways;
(*d*) canals, waterways, and inland navigations;
(*e*) roads, bridges and ferries, and vehicles and traffic thereon;
(*f*) harbours, docks, and piers;

including any powers and duties of any Government Department in relation to any railway, light railway, tramway, canal, inland navigation, harbour, dock, pier, or other undertaking concerned with any of the matters aforesaid, and any powers of any Government Department with respect to the appointment of members or the procedure of any commissioners, conservancy board or other body having jurisdiction with respect to any such matters as aforesaid, and any powers of any Government Department with respect to the making, confirming, issuing, granting, or giving (as the case may be) of byelaws, regulations, orders, licences, approvals, or consents relating to any of the matters hereinbefore mentioned:

Provided that—

(i) His Majesty in Council may by Order except from such transfer any particular powers or duties, or provide for the exercise or performance of any power or duty so excepted by the Minister concurrently or in consultation with or at the instance of the Government Department concerned, or by the Government Department concerned concurrently or in consultation with the Minister, or provide for the retransfer to any such Department of any powers and duties transferred to the Minister by this section; and

(ii) Nothing in this section shall transfer to the Minister any powers or duties of the Admiralty exerciseable in or in relation to ports declared under the Dockyard Port Regulation Act, 1865,[1] to be dockyard ports, but His Majesty in Council may by Order transfer to the Admiralty, instead of to the Minister, any of the powers of the Board of Trade with respect to dockyard ports, or with respect to the appointment of members of any commissioners, conservancy board, or other body having jurisdiction in the whole or any part of a dockyard port; and

(iii) Nothing in this section shall transfer to the Minister the powers of the Board of Trade with respect to the appointment of members or the procedure of the Railway and Canal Commission, but His Majesty in Council may by Order transfer those powers to a Secretary of State instead of to the Minister.

(2) His Majesty in Council may by Order make such incidental, consequential and supplemental provisions as may be necessary or expedient for the purpose of giving full effect to any transfer of powers or duties by or under this section, including provisions for the transfer of any property, rights and liabilities held, enjoyed, or incurred by any Government Department in connection with any powers or duties transferred, and may make such adaptations in the enactments relating to such powers or duties as may be necessary to make exercisable by the Minister and his officers or by the Admiralty and their officers, as the case may be, the powers and duties so transferred: Provided always that nothing herein contained shall enable the powers so transferred to be increased.

(3) In connection with the transfer of powers and duties to the Minister, Admiralty, or Secretary of State, by or under this Act, the provisions set out in the First Schedule to this Act shall have effect.

(4) There shall be attached to the Ministry a separate department charged with dealing in the ordinary course of departmental business with road construction, improvement, maintenance, and development.

POWER TO CONTROL TEMPORARILY RAILWAYS, ETC.

3.—(1) With a view to affording time for the consideration and formulation of the policy to be pursued as to the future position of undertakings to which this section applies, the following provisions shall, unless Parliament otherwise determines, have effect for a period of two years after the passing of this Act, or where as respects any particular provision a longer period is expressly provided, for such longer period—

(*a*) Where at the passing of this Act possession has been taken of any railroad undertaking or part thereof in pursuance of section sixteen of the Regulation of the Forces Act, 1871,[2] or otherwise, possession thereof shall be retained without any renewal of the warrant granted by the Secretary of State in pursuance of that section, upon the same terms as to compensation as those heretofore in force, and the Minister may exercise over all such undertakings all such powers as have hitherto been exercised by the Board of Trade under the said Act or with the consent of the owners of the undertakings or otherwise and such other powers as may be conferred by this section or agreed to by the railway companies concerned:

(*b*) The Minister may, after giving not less than one month's notice in writing, take possession, in the name or on behalf of His Majesty, of the whole or any part of any other statutory railway undertaking or of any light railway or tramway undertaking (other than a tramway or a light railway used as a tramway belonging to a local authority), or of any canal or inland navigation undertaking, and, subject as hereinafter mentioned, of any harbour, dock or pier undertaking, or of any plant belonging to any such undertaking as aforesaid or used thereon (exclusive of privately owned railway wagons), and of any barges, tugs, and other craft owned or held by the undertaking of which possession has been taken: Provided that such notice as aforesaid shall not, in the event of the matter being referred to an advisory committee as hereinafter provided, be given until the committee has reported:

(*c*) The directors and other persons concerned with the management, and officers and servants of any undertaking of the whole or part of which, or of the plant whereof, possession is retained or taken shall obey the directions of the Minister as to the user thereof, and any directions of the Minister in relation to the undertaking or part or plant thereof of which possession is retained or taken—

(i) as to the rates, fares, tolls, dues, and charges to be charged; subject, however, to the provisions hereinafter contained respecting references to the advisory committee established for advising as to directions on the matters aforesaid;

(ii) as to the salaries, wages, and remuneration and conditions of employment of persons employed on or in connection with the undertaking;

(1) 28 & 29 Vict. c. 125.

(2) 34 & 35 Vict. c. 86.

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(iii) as to the working or discontinuance of the working of the undertaking or any part thereof including directions as to keeping open or closing of any stations ;

(iv) for securing that the permanent way, rolling stock, plant, appliances, or equipment, whether fixed or moveable, are satisfactory in type and design ;

(v) as to the carrying out of alterations, improvements, and additions which the Minister considers necessary for the public safety or for the more efficient and economic working of the undertaking ;

(vi) for securing co-operation between undertakings and for securing the common user of facilities, rolling stock and equipment whether fixed or moveable ;

(vii) for affording running powers over their system, or any part thereof, to the owners of any other undertaking .

(viii) for securing that manufacturing and repairing facilities and auxiliary and ancillary services shall be used. and the purchase and distribution of stores shall be conducted, in such manner as may be most conducive to economy and efficiency.

Nothing in this section shall be construed as authorising the Minister to compel the owners of any such undertaking either to incur capital expenditure, or to draw upon their reserve funds, for new works or capital improvements to an extent which would seriously interfere with their finances, it being the intention that the financing of the undertakings from a capital point of view shall remain as far as possible with the owners.

(*d*) For enabling any directions given by the Minister under the last foregoing paragraph as to alterations, and improvements and additions to be carried into effect, the Minister may, by order, authorise the owners of any undertaking to acquire any land (or easements) and to construct any works, and the order may incorporate the Lands Clauses Acts, subject to such modifications as may be specified in the order, being modifications of those Acts made or authorised to be made by the Development and Road Improvement Funds Act, 1909,[3] or any other enactment, and may incorporate or apply any of the provisions of any enactment relating to the construction, maintenance, or working of railways, light railways, tramways, canals, harbours, docks, and piers, and any such order shall have effect as if enacted in this Act : Provided that nothing herein contained shall be deemed to empower the Minister to authorise the acquisition, otherwise than by agreement, of any land belonging to the owners of another undertaking to which this section applies, or of a local authority, or of a harbour dock or pier undertaking, but the Minister may authorise the acquisition of an easement or right of using such land for the purposes of any works the construction of which he may authorise under this section.

(*e*) In the case of any undertaking of which possession is retained or taken by the Minister as aforesaid any rates, fares, tolls, dues and other charges directed by the Minister shall be deemed to be reasonable, and may, notwithstanding any agreement or statutory provisions limiting the amount of such charges or increases therein, be charged in respect of any undertaking during the period for which the Minister retains possession of such undertaking, and for a further period of eighteen months after the expiration of the said period, or until fresh provision shall be made by Parliament with regard to the amount of any such rates, fares, tolls, dues, and other charges, whichever shall first happen :

(*f*) Notwithstanding anything contained in this Act, the rights of a consignor or consignee of goods or minerals, any trader or class of traders, or any port or harbour authority or dock company to complain to the Railway and Canal Commission under the Railway and Canal Traffic Acts 1854 to 1913 in respect of undue preference or undue disadvantage or allowances or rebates in relation to the provision of station accommodation or terminal services shall not be deemed to be affected, and it shall be no answer to any such complaint that the railway company in respect of which the complaint is made was acting under the directions of the Minister.

(2) Subject as aforesaid, any agreement made between the owners of any undertaking, of the whole or part of which possession has been retained or taken under this section, and any other person shall continue in force in like manner as if such possession had not been so retained or taken, unless the Minister considers that such agreement is contrary to the public interest, and in that case he may suspend or modify the operation of such agreement during the period of such possession and for a period not exceeding eighteen months thereafter, and any party to the agreement who suffers loss or injury by reason of such suspension or modification, and any person who, by virtue of any special statutory provision or agreement, is entitled to the benefit of any special rate, fare, toll, due, or other charge, and whose position relatively to other persons is prejudiced by any direction of the Minister altering such special charge, shall be entitled to receive such compensation as, in default of agreement, may be determined by the Railway and Canal Commission, regard being had to any change in circumstances.

(3) The exercise by the Minister of any of his powers under this section as respects any tramway or light railway used as a tramway which a local authority, or two or more local authorities, have power to purchase under any Act of Parliament or order having the effect of an Act of Parliament shall not affect such right of the local authority, or authorities, and upon the purchase thereof such tramway or light railway shall cease to be in the possession of the Minister.

(4) Nothing in this section shall be deemed to exempt from any local rate or assessment any undertaking to which this section applies.

(5) For the purposes of this Act, possession so taken or retained as aforesaid shall confer on the Minister such rights of control and direction as may be necessary for the exercise of his powers under this Act, but shall not confer on him any rights of ownership.

SAVING FOR STATUTORY HARBOUR, DOCK AND PIER AUTHORITIES.

4. Except where any harbour, dock, or pier forms part of a railway undertaking, nothing in section three of this Act shall apply to any harbour, dock, or pier undertaking established by Act of Parliament, including the Manchester Ship Canal, or to the owners of any such undertaking, without the consent of such owners, but, if at any time during the two years after the passing of this Act, the Minister shall consider that it is desirable in the national interest that the transport facilities and accommodation at the harbour, or at any dock or pier of the owners, should be improved or extended, or that the method of working should be altered, the Minister may by order, for the purposes aforesaid, require the owners to execute or do, within a reasonable time, such improvement or extension or alteration in the method of working as the order may prescribe, and may, for that purpose by order, confer on the owners any such powers of acquiring land or easements or constructing works as are mentioned in paragraph (*d*) of subsection (1) of that section : and the provisions of this Act relating to orders made under that paragraph shall apply to orders conferring such powers as aforesaid :

Provided that, if the owners of such undertaking consider that any such requirements are likely to be seriously injurious to the undertaking, or to the trade of the port, they may, within thirty days of receiving notice of such requirements from the Minister, appeal, in the case of an undertaking situate in England or Wales, to the Lord Chief Justice of England, or, in the case of an undertaking situate in Scotland, to the Lord President of the Court of Session, or, in the case of an undertaking situate in Ireland, to the Lord Chief Justice of Ireland, and, if it appears to such Lord Chief Justice or Lord President that a *prima facie* case is made out that the requirements of the Minister would be so injurious as aforesaid, he shall forthwith appoint an arbitrator to hold an immediate inquiry, and, if the arbitrator reports that the carrying out of the requirements of the Minister will be so injurious as aforesaid, the Minister shall revoke his requirements, without prejudice to the power of the Minister to issue a new order.

POWER TO GRANT THROUGH-RUNNINGS ON TRAMWAYS.

5. The Minister shall have the power to require through-runnings on adjoining tramways belonging to different owners, whether local authorities or not, and in default of agreement between such owners to settle the terms of such through-running, after hearing the said owners, in such manner as he thinks fit.

POWER TO RETAIN LANDS, Etc.

6. Where in pursuance of any direction given by the Minister under this Act the owners of any undertaking shall acquire any lands or easement, or construct any works, or carry out any alteration or improvement of or addition to their undertaking, the owners may, after the expiration of the period of possession, continue to hold and use such lands or easement and maintain and use such works, alteration, improvement, or addition for the purposes of their undertaking, and such land, easement, works, alteration, improvement, and addition shall for all purposes be deemed to form part of their undertaking.

PROVISIONS AS TO OFFICERS AND SERVANTS.

7.—(1) The following provisions shall apply with respect to officers or servants of any undertaking of which, or of any part or plant of which possession has been retained or taken under this Act (all of which officers and servants are in this Act hereinafter referred to as " existing officers and servants ")—

(i) Where the Minister requires the services of any existing officer or servant, that officer or servant may be transferred to the Minister—

(*a*) either permanently with the consent of the officer or servant ; or

(*b*) temporarily with the consent (which shall not unreasonably be withheld) of the officer or servant, and of the owners of the undertaking ;

(ii) No existing officer or servant so transferred, whether temporarily or permanently, shall without his consent be, by reason of such transfer or anything done under this Act, in any worse position in respect to the conditions of his service (including tenure of office, remuneration, gratuities, pension, superannuation, sick fund or any benefits or allowances, whether obtaining legally

(3) 9 Edw. 7. c. 47.

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or by customary practice), as compared with the conditions of service obtaining with respect to him at the passing of this Act, and, if any question arises as to whether the provisions of this paragraph have been complied with, the question shall be referred to a standing arbitrator or board of arbitration appointed by the Lord Chancellor for the purposes of this section, and, if the arbitrator or board consider that those provisions have not been complied with and that the officer or servant has thereby suffered loss or injury, they shall award him such sum as they think sufficient to compensate him for such loss or injury.

(iii) Where an existing officer or servant has been transferred either temporarily or permanently to the Minister under this section, then, so long as the Minister remains in possession of that undertaking or any part or plant thereof, that officer or servant may remain a full member of any pension or superannuation fund established in connection with the undertaking with all the rights to which he would be entitled had he continued in the service of the owners of the undertaking, and any contributions payable under the rules of the pension or superannuation fund or by customary practice by the owners of the undertaking may be paid by the Treasury out of moneys provided by Parliament, and he shall be entitled to receive such reasonable allowances for temporary disturbance as the Minister with the consent of the Treasury may determine (including direct pecuniary loss sustained in consequence of the transfer):

(iv) Every existing officer or servant not transferred to the Minister in pursuance of this Act shall, notwithstanding the powers conferred upon the Minister by this Act, continue to hold his office or situation under the owners of the undertaking under the same tenure and upon the same terms and conditions (including all conditions regarding gratuities, pension, superannuation, sick fund, or any benefits or allowances), whether obtaining legally or by customary practice, as he held it on the date of the passing of this Act, and while performing the same duties shall receive not less salary, wages, or remuneration than under existing regulations, agreements, or established customs of the service he would have been entitled to if this Act had not been passed:

(v) The Minister may direct that the office or situation of any existing officer or servant which he deems unnecessary shall be abolished: Provided that the Minister shall not require the abolition of any such office which will, in the opinion of the owners of the undertaking, be essential to them in their conduct of the undertaking at the end of the period of possession:

(vi) If by or in consequence of a direction of the Minister any existing officer or servant is, during the period of possession, required to perform duties such as are not analogous or which are an unreasonable addition to those which he has, prior to the date of the passing of this Act, been required to perform, such officer or servant may relinquish his office or service:

(vii) Every such officer or servant who so relinquishes his office or service as aforesaid, and every such officer or servant whose services by or in consequence of any such direction are dispensed with on the ground that his services are not required, or for any reason not being on account of any misconduct or incapacity, or whose salary, wages, or remuneration are reduced on the ground that his duties have been diminished by or in consequence of any such direction, or who otherwise suffers any direct pecuniary loss in consequence of this Act (including any loss of prospective superannuation or other retiring or death allowances, whether obtaining legally or by customary practice), shall be entitled to be paid by the Minister compensation for such pecuniary loss, to be determined by the Treasury, subject to appeal to such standing arbitrator or board of arbitration as aforesaid, in accordance with the provisions contained in section one hundred and twenty of the Local Government Act, 1888,[4] relating to compensation to existing officers, and those provisions shall apply accordingly as if they were herein re-enacted with the necessary modifications:

Provided that, in the case of any officer or servant who was appointed to his office as a specially qualified person at an age exceeding that at which public service usually begins, or of any officer or servant who suffers any loss of prospective superannuation or other retiring or death allowances as aforesaid, such addition may be made to the amount of compensation authorised under the said provisions as may seem just, having regard to the particular circumstances of such case: Provided further that the expression in sub-section (1) of section one hundred and twenty of the Local Government Act, 1888, "the Acts and Rules relating to Her Majesty's Civil Service" shall mean the Acts and Rules relating to His Majesty's Civil Service which were in operation at the date of the passing of the Local Government Act, 1888.

(2) Any person formerly in the employment of the owners of an undertaking of which or of any part or plant of which possession is retained or taken under this Act, who on the date of the passing of this Act is, though not legally entitled thereto, in receipt of a pension or other superannuation allowance, shall continue to receive from the owners of such undertaking the same pension or allowance on the same terms and conditions as if this Act had not been passed.

(3) Any person who, at the date of the passing of this Act, was in the employment of the owners of an undertaking of which or of any part or plant of which possession is retained or taken under this Act and who during the period of such possession, would, though not legally entitled thereto, in accordance with customary practice, be granted a pension or superannuation allowance by the owners of such undertaking, shall not be in any worse position in regard thereto by reason of the passing of this Act.

(4) This section shall apply to persons who are, or have been, members of the staff of the Railway Clearing House, or the Irish Railway Clearing House, or any railway conference, in like manner as if they were, or had been, officers or servants of an undertaking of which possession had been taken and the period of possession thereof had been the same as that of a railway undertaking, and to the Railway Clearing System Superannuation Fund, as if it was a pension or superannuation fund established in connection with an undertaking of which possession has been taken, and as if payments and contributions heretofore made by railway companies thereto were contributions payable by the owners of the undertaking.

CLAIMS AGAINST AND BY THE MINISTER IN RESPECT OF EXERCISE OF POWERS

8.—(1) Where at the end of the period of possession by the Government of any undertaking or of any part or plant of an undertaking the value of the undertaking on a revenue-earning basis has been reduced or enhanced as compared with the value at the commencement of such period, or where during that period the income thereof has been reduced or enhanced, after taking into account in either case—

(*a*) any capital expenditure by the owners of the undertaking on any works brought into use in the interval; and

(*b*) the natural growth of traffic on the undertaking,

then, if and so far as such reduction or enhancement is due to the exercise by the Minister during that period upon the undertaking in question of the powers under section three of this Act (including such powers as have been hitherto exercised by the Board of Trade as mentioned in paragraph (1) (*a*) of that section) the owners of the undertaking shall, unless such reduction or enhancement is otherwise provided for by the compensation mentioned in paragraph (1) (*a*) of that section, be entitled to be recouped, or liable to pay, the amount by which that value has been so reduced or enhanced, and if any question arises as to such amount or the liability to pay the same, or otherwise with respect to the financial relations between the Minister and any person affected by the exercise by the Minister of any of his powers under the said section, the question shall be determined by the Railway and Canal Commission having regard to all the circumstances of the case:

Provided that—

(i) no claim in respect of any loss alleged to be due to any direction issued by the Minister shall be entertained if the direction was issued with the concurrence of the owners of the undertaking; and

(ii) if, whilst an undertaking of which or of any part or plant of which possession has been taken remains in the possession of the Government, the State is authorised by Parliament to acquire the undertaking, nothing in this subsection restricting claims for enhancement attributable to the exercise by the Minister of such powers as aforesaid to cases where the value of the undertaking has been enhanced as compared with the value thereof at the commencement of the period of possession shall be held to affect, one way or the other, any question as to the principle on which the price to be paid on such acquisition is to be based.

(2) Without prejudice to any other form of payment or satisfaction, the Treasury, on the recommendation of the Minister, may, as or as part of the consideration for exercising any powers of control under the said section, guarantee the payment of any dividends or interest on any stock or other securities issued by the owners of an undertaking up to such amount as may be agreed, or the payment of any working expenses of the undertaking, and any sums required to fulfil any such guarantee shall be paid out of moneys provided by Parliament.

(3) Wherever the Minister has expended any sum in the capital improvement of any undertaking, the owners of the undertaking shall be liable to pay to the Minister the unexhausted value of such expenditure at the end of the before-mentioned period, if and so far as such expenditure is not covered by the payments to be made by the owners under the preceding provisions of this section, and that value shall, in default of agreement, be determined by the Railway and Canal Commission.

(4) The owners of the undertaking may satisfy any payment due from them under this section by creating a charge in favour of the Treasury upon the undertaking to such amount and in such form and with such priority as may be agreed, or, in case of difference, may be settled by the Railway and Canal Commission, who shall have due regard to the rights and interests of all parties concerned, but the charge so created shall in no case take priority to any capital raised by loan or debenture stock issued by the owners of the undertaking.

(4) 51 & 52 Vict. c. 41.

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(5) Any claim by a railway company against the Government for compensation in respect of the exercise by the Board of Trade of any powers over or in respect of the undertaking in pursuance of section sixteen of the Regulations of the Forces Act, 1871, or with the consent of the railway company, or otherwise, may be determined by the Railway and Canal Commission in like manner as if it were a claim arising under this section, and the Minister was the person liable to satisfy the claim.

(6) The Minister shall indemnify, and keep indemnified, the owners of any undertaking of which or of any part of which, or of any plant of which possession has been retained or taken, and the owners of any harbour, dock or pier undertaking, against all actions, claims, and demands made in respect of loss or injury alleged to be caused by the carrying out of any directions given by the Minister under section three of this Act, or, as the case may be, any requirements contained in any order made by the Minister under section four of this Act :

Provided that, where the loss or injury is due to the breach of any contractual obligation, the Minister shall not be liable under this provision unless before carrying out the directions the owners of the undertaking have given written notice to the Ministry of the existence of the obligation.

POWER TO ESTABLISH TRANSPORT SERVICES.

9.—(1) It shall be lawful for the Minister to establish, and either by himself or through any other person to work, transport services by land or water, and to acquire either by agreement or compulsorily such land or easements, to construct such works, and to do all such other things, as may be necessary for the purpose :

Provided that—

(i) no new transport service shall be established by the Minister until an estimate of the capital expenditure required to complete it, accompanied by details of the scheme for the establishment of the service, has been approved by the Treasury :

(ii) if in the case of any such service such estimate as aforesaid exceeds half a million pounds, or if the establishment of any such service involves the acquisition of land or easements compulsorily, or the breaking up of any roads, the Minister shall not exercise his powers of establishing the service unless authorised to do so by Order in Council a draft whereof has been approved by a resolution passed by both Houses of Parliament, and the Order may incorporate the provisions of the Lands Clauses Acts, subject to such modifications as may be specified in the Order, being modifications of those Acts made or authorised to be made by the Development and Road Improvements Funds Act, 1909, or any other enactment, and the Order may also incorporate or apply any enactments relating to the construction and maintenance of the works in question ;

(iii) where it appears to the Minister that the establishment of any such service could properly be undertaken by the owners of any existing undertaking, the Minister shall not himself establish the service without first giving to such owners an opportunity of establishing the service, and, where such an opportunity is given to the owners of an undertaking of which possession has been retained or taken under section three of this Act, and those owners prefer that the establishment of the service should be undertaken by themselves rather than by the Minister, they may require the Minister to give them directions under that section to that effect, but shall not be deemed to have thereby concurred in those directions ; and

(iv) the Minister shall not, after two years from the passing of this Act unless Parliament otherwise determines, commence the construction of any new works, or provide equipment for any transport service not established before that date.

(2) The Minister or other person working a service established under this section may charge such rates, fares, tolls, and charges in connection therewith as may be prescribed by the Minister, subject to reference to the Advisory Committee on Rates hereinafter established, and the expenses of working such services shall be paid out of the revenues derived therefrom, and the Minister shall keep or cause to be kept such accounts of the receipts from and expenditure on the services and in such form, and those accounts shall be audited in such manner as the Treasury may prescribe.

EXTRAORDINARY TRAFFIC.

10. Any transport service on roads established by the Ministry shall be subject to the provisions relating to extraordinary traffic contained in the Highways and Locomotives (Amendment) Act, 1878,[5] or in Scotland the Roads and Bridges (Scotland) Act, 1878,[6] or in Ireland the Public Roads (Ireland) Act, 1911,[7] (as amended by any subsequent enactment).

APPEAL AS TO BRIDGES.

11. An appeal shall lie to the Minister in respect of any restriction upon any traffic passing over or seeking to cross any bridge or culvert, and the Minister shall have power, notwithstanding any provision in any other statute, to make such order as he may think fit concerning the strengthening, standard of maintenance, and maintenance of any bridge or culvert, the traffic using it or seeking to use it, and apportionment of any expenditure involved, but no order made by the Minister under this section shall enlarge the pecuniary liability of any railway or canal company or impose any new liability upon any such company.

PROVISIONS AS TO NEW ROUTES FOR OMNIBUSES.

12.—Section twenty of the Local Government (Emergency Provisions) Act, 1916[8] (which relates to the establishment of new routes for omnibuses), shall continue in force until the expiration of two years after the passing of this Act, and shall have effect as if—

(*a*) the following provision was substituted for subsection (2) of the section (that is to say) :—

(2) Except as provided in subsection (4), this section shall not be deemed to detract from any existing powers of highway authorities in regard to omnibuses.

(*b*) the following subsection was added to the section (that is to say) :—

(4) Where, upon application for a licence to ply for hire with an omnibus, the licensing authority either refuses to grant a licence or grants a licence subject to conditions, in either case the applicant shall have a right of appeal to the Minister of Transport from the decision of the licensing authority, and the Minister shall have power to make such order thereon as he may think fit, and such order shall be binding upon the licensing authority.

POWERS AS TO RAILWAY WAGONS.

13.—(1) It shall be lawful for the Minister to purchase privately-owned railway wagons required for use on any railway on such terms and conditions as may be authorised by or under an Order in Council, a draft whereof has been approved by a Resolution passed by both Houses of Parliament, and to work or lease any such wagons when so purchased, or to apportion them among the several railway undertakings in such manner, on such terms, and subject to such conditions as may be provided by or under the Order :

Provided that the Minister shall not be entitled to purchase in England and Wales, or Scotland, or Ireland, respectively, wagons used for the conveyance of any particular class of traffic unless he purchases all privately-owned wagons so used which belong to or are used by persons carrying on business therein, and which comply with the regulations with respect to such wagons in force at the date of such purchase.

(2) Where, in the case of any wagon which has been in use on or before the fifteenth day of May, nineteen hundred and nineteen, the wagon has since that date been the subject of a purchase agreement, the price paid on such purchase shall not be evidence of the value of the wagon in determining the price to be paid by the Minister.

(3) Where the Minister has, in pursuance of his powers under this section, purchased any wagon, any contract then in force for the repair of the wagon shall upon the purchase be determined, unless otherwise agreed with the Minister.

(4) Where the Minister exercises his powers of purchasing wagons under this section, or of prohibiting or restricting the use of privately-owned wagons, or of limiting the number of wagons to be so used, the following provisions shall have effect :—

(*a*) The reasonable facilities which every railway company is required to afford under section two of the Railway and Canal Traffic Act, 1854,[9] as amended or explained by any other Act, shall, where the railway wagons of traders of any class have been purchased, include the provision of suitable railway wagons for the use of traders of that class, and it shall be the duty of the Minister so to exercise his powers of working or disposing of the wagons purchased by him as to enable the railway companies to fulfil their obligations under this provision as fully as may be practicable :

(*b*) Where the provision of wagons is not included in the authorised maximum rates of conveyance, a railway company may charge for the use of such wagons such sums as may be directed by the Minister under section three of this Act, and, if and so far as no such directions are in force, any sums not exceeding those prescribed for the use of such wagons by any Railway Rates and Charges Order applicable thereto :

(*c*) Notwithstanding the provisions of any other Act or any decision thereunder, in determining what sum may be charged under the provisions of any Railway Rates and Charges Order for the detention of wagons at the premises of any trader, regard shall be had to the requirements and reasonable usages of the trade carried on at those premises in connection with which such wagons are used.

(5) Notwithstanding any statutory or other provision to the contrary, it shall be lawful for the Minister to make regulations prohibiting or restricting the use on railways of privately-owned wagons or limiting the number of wagons to be so used and prescribing the type and capacity thereof :

Provided that nothing in this Act shall authorise the prohibition of the use on railways of such wagons as comply with regulations for the time being in force made in pursuance of the Railways Clauses Consolidation Act, 1845,[10] the Railways Clauses Consolidation

(5) 41 & 42 Vict. c. 77. (6) 41 & 42 Vict. c. 51. (7) 1 & 2 Geo. 5. c. 45. (8) 6 & 7 Geo. 5. c. 12. (9) 17 & 18 Vict. c. 31.

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(Scotland) Act, 1845,[11] or any other enactment in force at the date of the passing of this Act, and as are in use, under repair, or in course of construction at that date.

POWER TO DISCHARGE CAPITAL LIABILITIES BY ISSUE OF STCCK.

14.—(1) Any capital sum payable under this Act for reduction in the value of an undertaking, or for the purchase of privately-owned railway wagons, or any interest therein, may be discharged in whole or in part, if the Treasury so direct, by the issue of securities, and the amount of such securities equivalent to such capital sum shall, in default of agreement, be determined by the Railway and Canal Commission.

For that purpose the Treasury may create and issue securities which shall bear interest at such rate and shall be subject to such conditions and regulations as to repayment, redemption, or otherwise as the Treasury may direct or prescribe, and the regulations may apply with the necessary modifications any of the enactments relating to local loans stock; the interest on any such securities as aforesaid shall —

(*a*) in the case of securities issued for the purchase of railway wagons, be charged on the revenues derived from the wagons so acquired after payment thereout of working expenses, and, if and so far as such revenues are insufficient, on the Consolidated Fund of the United Kingdom or the growing produce thereof; and

(*b*) in the case of other securities, be charged on the Consolidated Fund of the United Kingdom or the growing produce thereof.

(2) Where the whole or any part of the purchase money for the interest in railway wagons belonging to a wagon finance company is discharged by the issue to the company of such securities as aforesaid, and the company in consequence of the exercise by the Minister of his powers under this Act of purchasing railway wagons is wound up voluntarily, the liquidator may present to the court having jurisdiction to wind up the company a scheme for the discharge in whole or in part of the liabilities of the company to the holders of debentures or debenture stock of the company by means of the transfer to them of an amount of the securities so issued to the company, and, if the court sanctions the scheme, those liabilities may be discharged accordingly.

For the purpose of this subsection, "wagon finance company" means a company whose principal business is the advance of money to colliery companies and other persons for the purpose of the acquisition by them of railway wagons.

INCORPORATION OF CERTAIN SECTIONS.

15.—An order made by the Minister authorising the owners of any railway undertaking to acquire any land (including easements), and to construct any works, or an Order in Council authorising the Minister to acquire land compulsorily for the purpose of a railway, shall incorporate sections seventy-seven to eighty-five of the Railways Clauses Consolidation Act, 1845, or, in Scotland, sections seventy to seventy-eight of the Railways Clauses Consolidation (Scotland) Act, 1845 (which relate to the working of mines), subject to any statutory modifications thereof then in force.

AMENDMENT OF SPECIAL ACTS (EXTENSION OF TIME ACT, 1915).

16.—The period of three years and six months from the passing of this Act shall be substituted for the period specified in section two, subsection (3), of the Special Acts (Extension of Time) Act, 1915,[12] with respect to all undertakings of which possession is retained or taken under this Act.

POWER TO MAKE ADVANCES FOR CERTAIN PURPOSES.

17.—(1) The Minister may, subject to the approval of the Treasury, make advances out of the moneys provided by Parliament to any authority, company or person, either by way of grant or by way of loan, or partly in one way and partly in another, and upon such terms and conditions as he thinks fit for any of the following purposes:—

(*a*) The construction, improvement or maintenance of railways, light railways, or tramways:

(*b*) The construction, improvement or maintenance of roads, bridges, or ferries:

(*c*) The construction, improvement or maintenance of harbours, docks or piers:

(*d*) The construction, improvement or maintenance of canals or inland navigations:

(*e*) The promotion and improvement of transport services by land or water:

And the power of the Treasury on the recommendation of the Development Commissioners to make advances for any of the purposes aforesaid shall cease and determine, except as respects advances for the construction, improvement, or maintenance of harbours in connection with the improvement and development of fisheries, in which case the Development Commissioners shall consult with the Minister before reporting on any application referred to them:

Provided that the Minister shall not make an advance exceeding one million pounds at any one time for the purpose of any work, unless specially authorised to do so by a Resolution of the House of Commons.

(2) For the purpose of advances for the construction, improvement, or maintenance of roads, the Minister may, after consultation with the Roads Committee hereinafter referred to and the local authorities affected, classify roads in such manner as he thinks fit, and may, by agreement with the local authority, defray half the salary and establishment charges of the engineer or surveyor to a local authority responsible for the maintenance of such roads, subject to the condition that the appointment, retention, and dismissal of such engineer or surveyor, and the amount of such establishment charges, shall be subject to the approval of the Minister.

ACCOUNTS, STATISTICS, AND RETURNS.

18.—For the period of two years after the passing of this Act it shall be the duty of the owners of any railway, light railway, tramway, canal, inland navigation, dock, harbour, or pier undertaking, and the authority or person liable to maintain any public highway or bridge, to furnish to the Minister, in such manner and form as he may direct, such accounts, statistics, and returns as he may require for the purpose of his powers and duties under this Act.

PROVISIONS AS TO THE RAILWAY AND CANAL COMMISSION.

19.—The provisions of the Railway and Canal Traffic Act, 1888,[13] as amended by any subsequent enactment, relating to the procedure for the determination of questions by the Commission under that Act, including the provisions relating to appeals, shall apply to the determination of questions referred to the Commission under this Act, as if they were herein re-enacted and in terms made applicable to this Act:

Provided that—

(*a*) the Commission may, in any case in which they think it expedient to do so, call in the aid of one or more assessors, specially qualified, and hear the case wholly or partially with the assistance of such assessors;

(*b*) the Commission may hold a local inquiry for the purposes of this section by any one of their members, or by any officer of the Commission or other person whom they may direct to hold the same, and the said provisions of the Railway and Canal Traffic Act, 1888, except the provisions relating to appeals, shall, so far as applicable, apply to such inquiries, and any officer or person directed to hold an inquiry shall have power to adminster oaths and shall report the result of the inquiry to the Commission:

(*c*) the discretion of the Commission with respect to costs shall not be limited in the manner provided by section two of the Railway and Canal Traffic Act, 1894.

POWER TO HOLD INQUIRIES.

20.—(1) The Minister may hold such inquiries as he considers necessary or desirable for the purposes of this Act, and the Minister, and, if authorised by the Minister, the person appointed to hold any such inquiry, may by order require any person, subject to the payment or tender of the reasonable expenses of his attendance, to attend as a witness and give evidence or to produce any documents in his possession or power which relate to any matter in question at the inquiry, and are such as would be subject to production in a court of law, and, if any person fails without reasonable excuse to comply with any of the provisions of any such order, he shall be liable, on summary conviction, to a fine not exceeding five pounds, and the person holding the inquiry shall have power to take evidence on oath and for that purpose to adminster oaths.

(2) Notices of inquiries may be given and published in accordance with such general or special directions as the Minister may give.

(3) The powers of the Minister under this section shall be in addition to and not in derogation of any powers of holding inquiries transferred to him from any other Government Department under this Act.

RATES ADVISORY COMMITTEE.

21.—(1) For the purpose of giving advice and assistance to the Minister with respect to and for safeguarding any interests affected by any directions as to rates, fares, tolls, dues, and other charges or special services, a committee shall be appointed consisting of five persons, one being a person of experience in the law (who shall be chairman) nominated by the Lord Chancellor, two being representatives of the trading and agricultural interests nominated by the Board of Trade, after consultation with the Associated Chambers of Commerce, the Central Chamber of Agriculture, and other interests concerned, one being a representative of transportation interests nominated by the Minister, one being a representative of labour interests nominated by the Minister of Labour, after consultation with the Parliamentary Committee of the Trades Union Congress and other interests concerned, together with, if deemed advisable, one additional member who may at the discretion of the Minister be nominated from time to time by him.

(2) Before directing any revision of any rates, fares, tolls, dues, or other charges, or of any special services, the Minister shall refer the matter to the committee for their advice, and they shall report thereon to him, and, where such revision is for the purpose of an increase in the net revenue of any undertakings which the Minister

(10) 7 & 8 Vict. c. 20.) (11) 7 & 8 Vict. c. 33. (12) 5 & 6 Geo. 5. c. 72. (13) 51 & 52 Vict. c. 25.

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determines to be necessary, the committee shall also advise as to the best methods of obtaining such increase from the different classes of traffic, having due regard to existing contracts and the fairness and adequacy of the methods proposed to be adopted. Before prescribing the limits of rates, tolls, or charges in connection with a new transport service established under section nine of this Act, the Minister shall refer the matter to the Committee for their advice.

(3) The committee, before reporting or advising on any matters referred to them under this section, shall, unless in their discretion they consider it unnecessary or undesirable to do so, give such public notice as they think best adapted for informing persons affected of the date when and the place where they will inquire into the matter, and any persons affected may make representations to the committee, and, unless in their discretion the committee consider it unnecessary, shall be heard at such inquiry, and, if the committee in their discretion think fit, the whole or any part of the proceedings at such inquiry may be open to the public :

Provided that, for the purpose of this provision, the council of any city, borough, burgh, county, or district shall be deemed to be persons affected in any case where such council or any persons represented by them may be affected by any such proposed revision as aforesaid.

(4) The committee shall hear such witnesses and call for such documents and accounts as they think fit, and shall have power to take evidence on oath, and for that purpose any member of the committee may adminster oaths.

(5) There shall be paid out of moneys provided by Parliament to all or any of the members of the committee such salaries or other remuneration as the Minister, with the consent of the Treasury, may determine.

(6) For the purposes of this section, " special services " means the services mentioned in section five of the schedule to the orders relating to railway rates and charges, and in the corresponding sections of the schedules to the orders relating to canal tolls, rates and charges, confirmed by various Acts passed in the years eighteen hundred and ninety-one to eighteen hundred and ninety-four.

ROADS ADVISORY COMMITTEE.

22.—(1) For the purpose of giving advice and assistance to the Minister with respect to and for safeguarding any interests affected by the exercise of the powers and the performance of his duties under this Act in relation to roads, bridges and vehicles and traffic thereon, a committee (hereinafter referred to as the Roads Committee) shall be appointed.

(2) The Roads Committee shall consist of not less than eleven members, of whom five shall be representative of highway authorities, appointed after consultation with such authorities and five shall be representative of the users of horse and mechanical road traffic appointed after consultation with the interests concerned and one shall be a representative of labour appointed after consultation with the interests concerned.

(3) The chairman shall be elected by the members of the committee from among their own number and the secretary of the Roads Committee shall be appointed by the Minister.

(4) The Roads Committee may make regulations as to their procedure and method of voting and may at their discretion consider and report to the Minister upon any matters affecting the construction, improvement, or maintenance of roads or bridges or the regulation of traffic thereon.

ADVISORY COMMITTEES.

23.—(1) For the purpose of giving advice and assistance to the Minister in connection with the exercise and performance of his powers and duties, the Minister shall set up a panel of experts, and of impartial persons of wide commercial and trading experience, appointed from nominees, after consultation with the various undertakings and interests concerned of the various classes of undertakings affected by this Act, and of labour, trading interests, local authorities, and such other interests as he may deem desirable.

(2) Before exercising any of the powers under subsection (1) (*b*) of section three of this Act, to the exercise of which the owners of the undertaking concerned object, or establishing new transport services by land or water, the Minister shall refer the matter to a committee selected by him from the said panel.

(3) The advisory panel or any committee to whom any matter is referred under this section shall, before reporting or advising, if they see fit, give public notice and permit any person affected or likely to be affected to place his views before them either orally or in writing.

(4) Any member of the advisory panel, or any committee thereof, or of any other committee established under this Act, for giving advice and assistance to the Minister, shall be considered to be acting entirely in a confidential capacity.

CONSENT OF LOCAL AUTHORITY.

24.—Nothing in this Act shall be construed as giving power to the Minister to impose any conditions upon a local authority which shall entail expenditure without consent of such local authority, or of the Minister of Health, or in Scotland the Secretary for Scotland or in Ireland the Local Government Board for Ireland.

STAFF AND REMUNERATION.

25.—(1) The Minister may appoint such secretaries, officers, and servants of the Ministry as the Minister may, subject to the consent of the Treasury as to number, determine :

Provided that there shall not be more than one paid parliamentary secretary of the Ministry.

(2) There shall be paid out of moneys provided by Parliament to the Minister an annual salary not exceeding five thousand pounds, and to the parliamentary secretary of the Ministry an annual salary not exceeding fifteen hundred pounds, and to the other secretaries, officers, and servants of the Ministry such salaries or remuneration as the Treasury may from time to time determine.

(3) The expenses of the Ministry, to such amount as may be sanctioned by the Treasury, shall be paid out of moneys provided by Parliament.

(4) There shall be transferred and attached to the Ministry such of the persons employed under any other Government Department in or about the execution of the powers and duties transferred by or under this Act to the Minister, as the Minister and the other Government Department, with the sanction of the Treasury, may determine.

(5) The Minister may from time to time distribute the business of the Ministry amongst the several persons transferred or attached thereto in pursuance of the foregoing provisions of this section in such manner as he may think right, and those officers shall perform such duties in relation to that business as may be directed by the Minister :

Provided that such person shall be in no worse position as respects the tenure of his office, salary or superannuation allowances than they would have been if this Act had not been passed.

SEAL, STYLE AND ACTS OF MINISTER.

26.—(1) The Minister may sue and be sued in respect of matters, whether relating to contract tort or otherwise arising in connection with his office, by the name of the Minister of Transport, and may for all purposes be described by that name and shall be responsible for the acts and defaults of the officers and servants and agents of the Ministry in like manner and to the like extent as if they were his servants, and costs may be awarded to or against the Minister.

(2) The Minister shall have an official seal, which shall be officially and judicially noticed, and shall be authenticated by the signature of the Minister, or of a secretary, or any person authorised by the Minister to act in that behalf.

(3) For the purpose of acquiring and holding land, the Minister for the time being shall be a corporation sole by name of the Minister of Transport, and all land vested in the Minister shall be held in trust for His Majesty for the purposes of the Ministry of Transport.

(4) Upon and by virtue of the appointment of any person to be Minister, the benefit of all deeds, contracts, bonds, securities or things in action vested in his predecessor at the time of his predecessor ceasing to hold office, shall be transferred to and vested in and enure for the benefit of the person so appointed, in the same manner as if he had been contracted with instead of his predecessor, and if his name had been inserted in all such deeds, contracts, bonds, or securities instead of the name of his predecessor.

(5) Subsections (2) to (4) of section eleven, and subsections (2) and (3) of section twelve of the New Ministries and Secretaries Act, 1916,[14] shall apply to the Minister and the Ministry of Transport and to the office of Minister of Transport in like manner as they apply to the Ministers and Ministries mentioned in those sections.

ABILITY OF MINISTER AND SECRETARIES TO SIT IN PARLIAMENT.

27.—(1) The office of Minister of Transport, or of secretary in the Ministry of Transport, shall not render the holder thereof incapable of being elected to or sitting or voting as a member of the Commons House of Parliament.

(2) The person who is first appointed to be Minister shall not by reason of such appointment, if a member of the Commons House of Parliament, vacate his seat as such member.

PROVISIONS AS TO ORDERS IN COUNCIL.

28.—(1) Before any Order in Council under this Act is made, notice of the proposal to make the Order and of the place where copies of a draft of the Order can be obtained shall be published in the London, Edinburgh, and Dublin Gazette, as the case may require, and in such other manner as the Minister thinks best adapted for ensuring publicity.

(2) An Order in Council under this Act may be altered or revoked by a subsequent order.

PROVISION AS TO ORDERS AND ORDERS IN COUNCIL RELATING TO THE ACQUISITION OF LAND AND THE CONSTRUCTION OF WORKS.

29.—(1) The Minister may make rules in relation to matters preliminary to the making of Orders and Orders in Council under this Act which authorise the acquisition of land or easements, or the breaking up of roads and the construction of works, including the publication of notices and advertisements, and the deposit of plans and sections and books of reference to those plans, and the manner in which and the time within which representations or objections are to be made, and to the holding of local enquiries.

(14) 6 & 7 Geo. 5. c. 68.

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Any rules so made shall be laid before Parliament as soon as they are made and shall have the same effect as if enacted in this Act: Provided that, if an Address is presented to His Majesty by either House of Parliament within twenty-one days on which that House has sat next after any such rules are so laid praying that any such rule may be annulled, His Majesty may annul the rule, and it shall thenceforth be void, but without prejudice to the validity of anything done thereunder.

(2) The rules of procedure set out in the Second Schedule to this Act shall apply to the making of any Order under paragraph (*d*) of subsection (1) of section three of this Act and of any draft of an Order in Council to be submitted to Parliament under section nine of this Act.

(3) The Minister on publication of notice of a proposal to make an order under paragraph (*d*) of subsection (1) of section three of this Act shall, except as hereinafter provided, send to the Chairman of Committees of the House of Lords and the Chairman of Ways and Means in the House of Commons a copy of the draft Order, and if within fourteen days of the receipt of the copy, if Parliament is then sitting, or within one month thereof if Parliament is not then sitting, either such Chairman reports to the Minister that he is of opinion that the proposals of the draft Order are of such a character or magnitude that they ought not to be proceeded with without the authority of Parliament, the Minister shall not make the Order unless or until the draft Order has been approved by a Resolution passed by both Houses of Parliament, and, if the Resolution of either House directs that the proposals shall be dealt with by Private Bill and not by such Order as aforesaid, notices published and served and deposits made for the purpose of the proposed Order shall, subject to standing order, be held to have been published, served and made for a Private Bill applying for similar powers:

Provided that this subsection shall not apply to any Order with respect to which the Minister certifies that the acquisition of the land or easements authorised to be acquired thereunder and the works authorised to be constructed thereunder do not involve an estimated expenditure exceeding one million pounds, nor to any Order of any class which may be exempted from the provisions of this subsection by rules made by the said chairmen.

SHORT TITLE AND INTERPRETATION.

30.—(1) This Act may be cited as the Ministry of Transport Act 1919.

(2) In this Act, unless the context otherwise requires—

The expression "Government Department" includes any Government Department and any Minister of the Crown acting as the head of a Government Department, and for the purposes of this Act the Road Board and the Lord Lieutenant and the Privy Council of Ireland, the Commissioners of Public Works in Ireland, and the Congested Districts Board for Ireland and the Commissioners of the Caledonian Canal and the Commissioners of the Conservancy of the River Mersey shall be deemed to be Government Departments;

The expression "tramway" includes a trackless trolley vehicle system;

The expression "easement" includes any right in or over land;

The expression "undertaking" includes any services carried on as ancillary to the principal business of the undertaking;

The expression "transport services by water" shall not include any transport service by sea other than such as is, or could under their existing statutory powers, or any extension thereof which may hereafter be authorised by Parliament, be established by the owners of any undertaking of which the Minister is for the time being in possession under this Act.

Where an undertaking is leased to or worked by a company or person other than the owners, the expression "the owners of an undertaking" shall include that company or person, except where such an interpretation is inconsistent with the terms of the lease or working agreement, and except for the purposes of the provisions of this Act relating to payments to be made to or by the owners of an undertaking in respect of any reduction or enhancement of the value of the undertaking.

FIRST SCHEDULE (SECTION 2).

Transitory Provisions.

1. In the construction and for the purposes of any Act of Parliament, any judgment, decree, order, award, deed, contract, regulation, byelaw or other document passed or made before the transfer to the Minister or Admiralty or Secretary of State from any other Government Department of any powers or duties by or under this Act, but so far only as may be necessary for the purpose of such transfer, the name of the Minister or Admiralty or Secretary of State shall be substituted for the name of the other Government Department.

2. Where anything has been commenced by or under the authority of any other Government Department before the transfer to the Minister or Admiralty or Secretary of State of any powers or duties by or under this Act, and such thing is in relation to the powers or duties so transferred, such thing may be carried on and completed by or under the authority of the Minister or Admiralty or Secretary of State.

3. Where at the time of the transfer of any powers or duties by or under this Act any legal proceeding is pending to which any Government Department is a party, and such proceeding has reference to the powers and duties transferred by or under this Act, the Minister or Admiralty or Secretary of State shall be substituted in such proceeding for the other Government Department, and such proceeding shall not abate by reason of the substitution.

SECOND SCHEDULE (SECTIONS 9 and 29).

1.—(1) Before any Order under section 3 (1) (*d*) of this Act is made, or any draft Order in Council under section 9 of this Act is submitted to Parliament, notice shall be published in such manner as the Minister may think best adapted for informing persons affected of the proposal to make the Order or Order in Council, and of the place or places where copies of the draft Order or Order in Council may be obtained, and of the place or places where plans of any lands (including easements) proposed to be compulsorily acquired, and plans and sections of any works proposed to be constructed and books of reference to those plans may be inspected and of the time (which shall be not less than twenty-one days) within which any objection made with respect to the draft by or on behalf of persons affected must be sent to the Minister.

(2) Every objection must be in writing, and state—

(*a*) the specific grounds of objection; and

(*b*) the omissions, additions, or modifications asked for.

(3) The Minister shall consider any objection made by or on behalf of any person, being in the case of a draft Order a person affected, and in the case of a draft Order in Council a person whose property will be injuriously affected by reason of the acquisition of the land or the construction of the proposed works, if the objection is sent to the Minister within the required time, and may, if thought fit, amend the draft, and shall then cause the amended draft to be dealt with in like manner as an original draft.

(4) Where the Minister does not amend or withdraw a draft to which any objection has been made, then (unless the objection either is withdrawn or appears to him to be frivolous) he shall before making the Order or submitting the draft Order in Council to Parliament direct an inquiry to be held in the manner hereinafter provided, and may, after considering the report of the person who held the inquiry, make the Order or submit the draft Order in Council to Parliament either without modification or subject to such modification as he may think fit, or may refuse to make the Order or submit the draft Order in Council to Parliament.

2.—(1) The Minister may appoint a competent and impartial person to hold an inquiry with regard to any draft and to report to him thereon.

(2) The inquiry shall be held in public, and any person who being entitled to do so has duly made an objection, may appear at the inquiry either in person or by counsel, solicitor, or agent.

(3) The witnesses on the inquiry may, if the person holding it thinks fit, be examined on oath.

(4) Subject as aforesaid, the inquiry and all proceedings preliminary and incidental thereto shall be conducted in accordance with rules made by the Minister.

(5) The fee to be paid to the person holding the inquiry shall be such as the Minister may direct.

LONDON TRAFFIC ADVISORY COMMITTEE.

The following announcement was officially issued on November 5—

The Minister of Transport has appointed an Advisory Committee to advise him and to assist the Ministry in dealing with those matters connected with London traffic which come within its province.

Mr. Kennedy Jones, M.P., has accepted the chairmanship of the Committee, which is being constituted as follows—

Mr. Will Thorne, M.P.

Sir Charles de Bartolomé, Director-general of Development Department, Ministry of Transport.

Sir Henry Maybury, Director-general of Roads Department, Ministry of Transport.

Mr. Frank L. D. Elliott, representing the Home Office.

Mr. E. S. Underwood, representing the City Corporation.

Mr. G. H. Hume, representing the London County Council.

Alderman F. Dent, of the Essex County Council, representing the five County Councils inside the Metropolitan area but outside the County of London.

Secretary, Mr. J. A. C. Champion, Development Department, Ministry of Transport.

The first meeting took place on Monday, November 10. The proceedings were private.

Cost of the Eight-Hour Day on the Underground.—The adoption of the eight-hour day by the omnibus services and the tramways and railways operated by the Underground group of companies will entail an additional expenditure of £700,000 per annum, and approximately 20 per cent. more staff are required to work the services.

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FRASER AND CHALMERS' ENGINEERING WORKS, ERITH, KENT.

At the invitation of the directors of the General Electric Company, the proprietors, a number of press representatives visited the Fraser and Chalmers' works at Erith on November 3, and were given an opportunity of inspecting the various departments, together with the plant in course of construction.

In the course of a most interesting speech, in which he welcomed the visitors, Mr. H. Hirst, chairman of the General Electric Company, explained that it was the settled policy of the General Electric Company to be in a position to compete with all comers for the world's work. He contended that now we had ceased to fight for our lives, it was our duty to be prepared to fight for our living. In the past the majority of British manufacturers had been content to turn out a certain class of machine, of which they may have had reason to be justly proud, without care or thought as to the possibilities of linking up the various units which go to make a complete plant upon some ordered plan, and thus not only raise the efficiency of such plant, but vastly strengthen the position of our home factories from the competitive point of view.

Recently there had been a decided movement in this direction, and it was in order that the company should be better equipped to meet the competition both at home and abroad, and be able to undertake a fair share of the vast amount of reconstructional work which will be offered to manufacturers, that they had decided to acquire the works of Fraser and Chalmers, Limited. Hitherto they had mnaufactured electric generators at Witton without knowing to what prime mover they were to be coupled. To-day, however, they were able to quote for the complete generating set, and were in a position definitely to control every detail of its construction.

DESCRIPTION OF THE WORKS.

Fraser and Chalmers, Limited, was formed as a public company in 1890, with the particular object of constructing works in this country for the manufacture of machinery for metalliferous mines and metallurgical works, based on American practice, where this industry had at that time been more highly developed than in any other market. The General Electric Company, Limited, took over the works in April, 1918, and complete reorganisation from war conditions has now been made, with a view to concentration upon the production of the various special lines of manufacture, consisting of turbines, turbo-blowers, turbo-compressors, conveying, transporting and unloading plants, mining machinery, winding engines, gas cleaning plants for blast furnaces, rolling mill equipment, and general engineering. Considerable extensions are being made to the shops to make adequate provision for the ever-increasing call for the company's productions in these special lines.

The works cover an area of about 18 acres, and are excellently situated for both inland and export trade. The shops comprise pattern shop, carpenter's shop, smithy, iron foundry, boiler and

15,000 kw. (23,500 kw. Overload) High Pressure Turbo-Alternator Under Construction at Fraser and Chalmers' Works at Erith for Glasgow Corporation.

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plate shop, large machine shops given to general engineering work, and turbine machine shop, dealing entirely with the steam turbine manufacture, making a self-contained unit. The main offices are adjacent to the shops, and in normal times over 2,000 employees are engaged in the production of finished machinery, aggregating approximately 800 to 1,000 tons per month.

The power generating station is of the most up-to-date design and construction, inasmuch as the whole works are electrically driven. The boiler-house is equipped with water tube boilers, by Babcock and Wilcox, working at 175 lb. per square inch, fitted with chain grates. The coal is fed by a belt conveyor into an overhead hopper, and it automatically descends by gravity into the furnaces of the boilers. The turbine, to which is coupled direct a G.E.C. "Witton" 1,500 K.W. 3-phase, 50-cycle alternator, at 3,000 revolutions per minute, is of Fraser and Chalmers' manufacture. There are two G.E.C. "Witton" rotary converters, electrically coupled in parallel, running at 500 revolutions per minute, producing direct current at 440 volts. The switchboard and gear is also of the General Electric Company's manufacture.

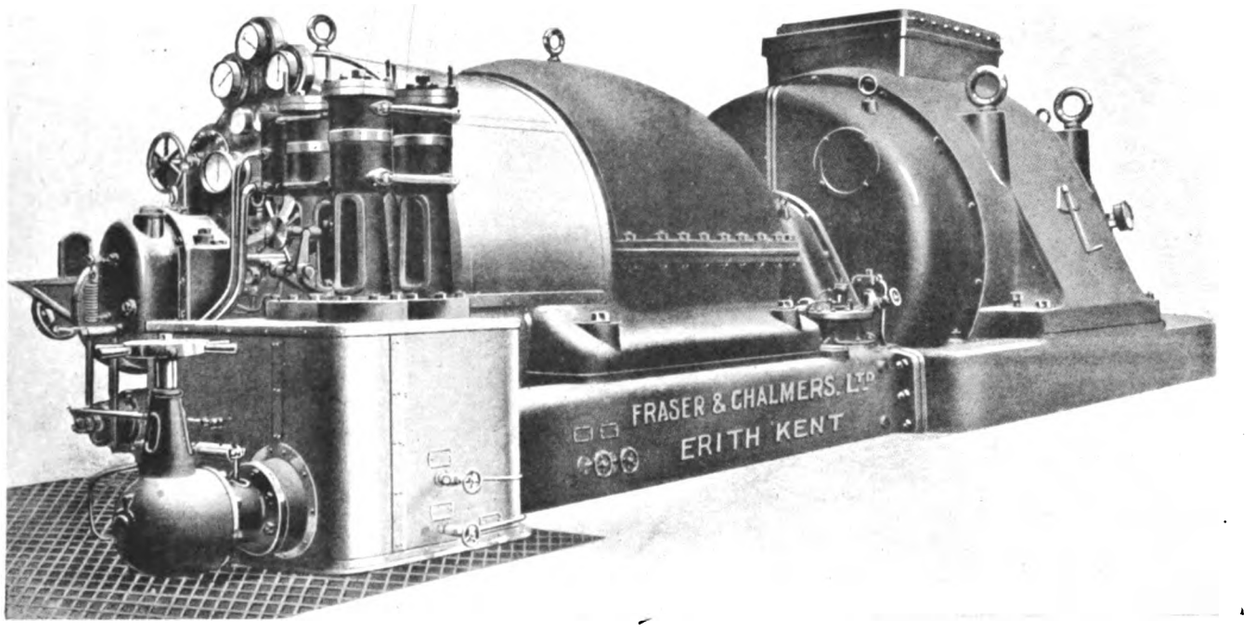
A well equipped smiths' shop contains an oil-fired annealing furnace. The foundry is composed of two main bays measuring 360 ft. by 155 ft., and is situated approximately in the centre of the works and adjacent to the main railway sidings. The entire length of these bays is covered by six 25-ton electrical overhead travelling cranes. The department is also well equipped with large and small jolt ramming machines, also pneumatic moulding machine

a considerable number of test beds have been built, with the necessary condensing plant underneath. On either side of this shop there is a gallery, one of which is entirely devoted to the manufacture of blades for turbines. The greatest possible care is exercised in regard to the material and the workmanship, so as to produce a high-class article. This has involved a great amount of labour and expense, including special machine tools and methods, jigs, tools, etc. The other gallery is devoted entirely to the assembling, rivetting, and finishing of wheels for turbines and blowers. Special electrical heating devices are installed in this department so as to ensure satisfactory rivetting of the bands on the ends of the blades.

The woodworking department is contained in a separate block of buildings, and comprises the carpenters' shop, pattern shop, and pattern storage. The pattern shop is on the first floor, and is adjacent to the drawing office. It contains labour-saving devices, such as Wadkin pattern-making machine, disc grinder, band saws, circular saws, and planing machines. The whole of the different working departments are fitted with sprinklers in the event of fire.

A separate department has been installed and fitted with the necessary tools and machines required for the manufacture of belt conveyors, grab transporters, gas cleaning plant details, and idlers for conveyors, the demand for which has necessitated a new shop adjacent to the existing building in order to cope with the demand.

At a period when the steam turbine was in its elementary stage, and manufacturers failed to show any marked progress in its further-



6,300 kw. High Pressure Turbine and Alternator (3,000 r.p.m.). South Metropolitan Light and Power Co.

for repetitive work. The whole of the sand-mixing and other machines are electrically driven, and Piftin hot-air mould drying machines are also installed. Provision has been made for high-grade and difficult castings up to approximately 35 tons weight.

The boiler and plate shop has been specially equipped for the manufacture of boilers, mining plant, gas cleaning and conveyor plant structural work, furnaces, etc., and is fitted with pneumatic tools for caulking and rivetting in addition to the hydraulic presses and rivetting installation. It is also equipped with oxy-acetylene and electrical cutting and welding plants, also special machines for dealing with perforated plates and tank work, such as large shears, rolls, etc.

The general engineering shop is arranged for the manufacture of large winding engines and air compressors, both steam and electrically driven, also fixed large steam engines for mill and factory driving, and various classes of mining machinery and general engineering. It is well equipped with overhead cranes up to 25 tons, also large boring, turning, planing, and slotting machines. Adjacent to this department is the works tool room.

The turbine shop has been specially designed and fitted for the manufacture of large steam turbines and turbo-blowers and turbo-compressors, and is equipped with such high-class machinery as boring and turning mills, planing machines, lathes, presses (for forcing the shafts into the rotors of turbines), balancing machinery, etc.

It is the firm's custom to erect and test every machine in this department before despatch. In order to do this satisfactorily

ance, Fraser and Chalmers recognised the enormous possibilities of turbine machinery, and decided to develop the Rateau impulse type steam turbine, and they were the first British firm to take up the manufacture in this country.

Exhaustive experimental tests were carried out at the Erith Works, developing the multi-stage impulse turbine, with remarkable success, to which initial work is due undoubtedly the present leading position held by the impulse steam turbine. Fraser and Chalmers were foremost in the development of high, low, and mixed pressure turbines, in high power machines running up to 3,000 revolutions per minute, being amongst the first to produce 5,000 K.W. units running at this speed. The accompanying view shows a 6,300 K.W. high pressure turbine coupled to turbo-alternator running at 3,000 revolutions per minute.

The present production includes the aforementioned types, in standard sizes, ranging from 500 KW. to 30,000 KW. per unit, designed for the highest steam pressures and superheats, and for every class of power production. Many special features are embodied in design and construction, including Fraser and Chalmers' (patented) mixed pressure turbine governing gear. A typical unit now under construction for the Glasgow Corporation is a high pressure machine with a normal capacity of 15,000 KW. and overload up to 23,500 KW., running at 1,500 revolutions per minute, and designed for divided flow in the low pressure stage. This machine is shown in the illustration on the opposite page under erection in the turbine shop.

Fraser and Chalmers are also pioneer manufacturers of turbo-blowers and compressors, which have developed equally with the

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steam turbine, and to-day have the largest machines in successful commission in England.

The Rateau turbo-blower has attained remarkable success, serving all types of furnaces, Bessemer converters, etc., in the largest iron and steel works, ranging in capacities from 2,000 to 60,000 cu. ft. of free air per minute at a pressure varying from 2 to 40 lb. per square inch.

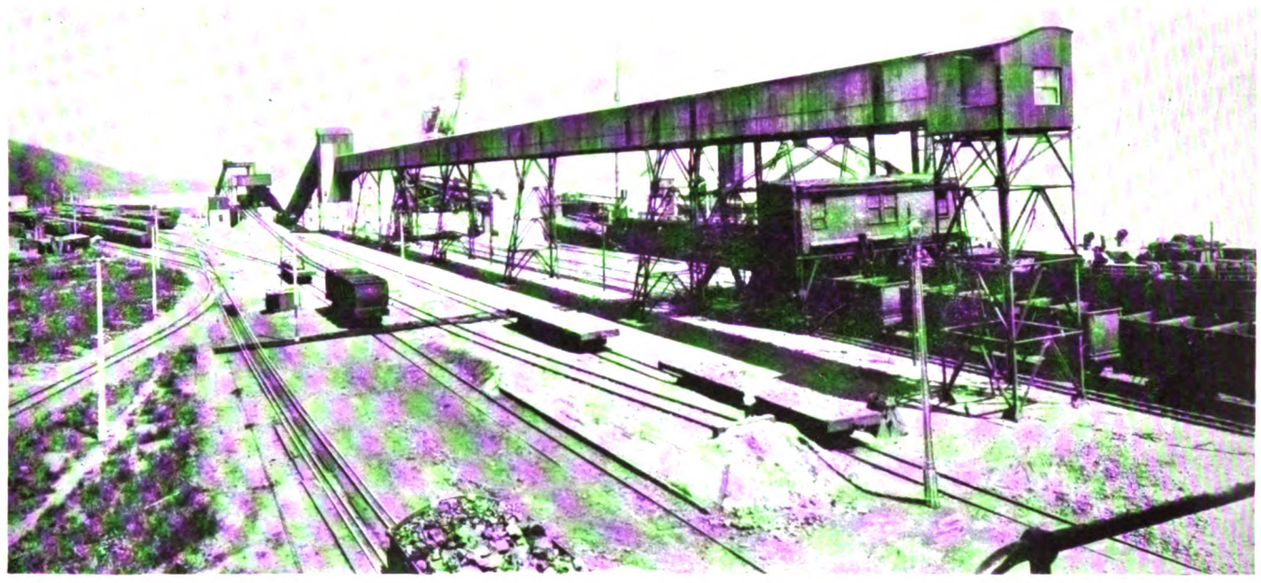
The economic handling of large quantities of material in bulk covers a vast field of operation in practically every industry, and is one which has occupied the attention of Fraser and Chalmers for many years past. The productions in this direction comprise the complete installation of the largest types of plants for handling coal, ore, grain, and many other materials embodying the use of a large range of belt, tray, and gravity bucket conveyors, bucket elevators, hoists, wagon tipplers, electrically-driven transporters and grabs. Many of the largest coal and ore shipping plants in the world have been constructed by Fraser and Chalmers.

Belt conveyors now in successful operation are dealing with quantities up to 1,500 tons per hour on a single belt, which is by no means the maximum size of belt possible. Recently a very simple form of portable loading and stacking conveyor has been designed, which is particularly useful for dealing with temporary stocks of coal dumped in odd places about yards and along railway sidings. The structure of this machine is comparatively light, and being mounted on broad flanged wheels renders it mobile and adaptable for all circumstances.

pressure for power plants to augment existing stations and for installation in new factories in connection with munitions. Turbo-blowers and turbo-compressors were also supplied in connection with the various iron and steel works, and the Erith Works were therefore instrumental in providing power not only for munition factories, but for the essential industries whose output of raw material was necessary before shells and guns could be produced.

The conveyor department also contributed in no small measure to the great end of the successful prosecution of the war, plants being installed not only for Government purposes in this country but also for the Allied Governments A large transporter plant was erected by the company at Rouen, and also a further transporter plant at Dunkirk, while a very large and important plant was completed for Durban Harbour for the shipment of coal for Admiralty and other purposes The plant shown below was constructed for the South African State Railways.

The efficiency of the dry gas cleaning process in connection with plants for blast furnaces and the manufacture of iron and steel was fully realised. The extraction of potash from the dust deposit of these plants provided a means of safeguarding the supply of this very necessary article in connection with the manufacture of optical glass, and the Government were quick to take control of the manufacture and use of such plants. In view of this, the Government placed an order for 20 complete gas cleaning units for allocation to the various iron and steel works throughout the country.



Belt Conveyor Coal-Handling Plant Constructed by Fraser and Chalmers for South African State Railways and Erected at Durban.

Fraser and Chalmers have long specialised in the manufacture of large grabs for handling coal, ore, and other material.

The conveyor department undertakes the design of complete equipments for mechanically handling any class of material, and have sound practical experience of the most important problems arising in this direction.

Fraser and Chalmers' Engineering Works are the sole manufacturers in Great Britain of the Halberg-Beth process of dry cleaning blast furnace gases. The first plant installed in this country was a small capacity unit of 350,000 cu. ft. of gas per hour, whereas the largest plant now under construction will effectively deal with 9,000,000 cu. ft. per hour, which comparison shows the extent of the company's development and success with this particular branch of manufacture.

In addition, the dry gas cleaning process has opened a valuable source of potash production in this country, being a by-product of the dust deposit and obtained in large quantities.

The steel works department of Fraser and Chalmers' Engineering Works is devoted to the manufacture of complete rolling mill plants, including blast and steel furnaces, cogging and plate mills, reversing and three high; strip mills, tube mills, rail and section mills, tire mills, merchant bar mills, three high and double two high; wire rod mills, with all accessory machinery, such as shears, saws, wire winders, hammers, roll lathes, etc.

The works during the war period were occupied to the utmost extent on the standard lines of turbines and turbo-blowers, as the various Ministry and other authorities were keeping up heavy

Entirely apart, however, from the pressure on these standard manufactures of the company, a large amount of purely war work was successfully undertaken for the Admiralty, War Office, Ministry of Munitions, and other contractors. This included the erection of Diesel engines for the Admiralty, together with the supply of the various parts of these engines; a considerable amount of buoy work for the Admiralty and Port of London Authority; trawler engines for both the British and French Admiralties; pontoon boats; armoured cars; heavy gun parts; shell dies; cast-iron chemical shells; the erection and re-conditioning of guns, and the supplying of parts and fitting up of a number of the earliest caterpillar tractors.

With the advent of the Armistice, however, immediate steps were taken to discontinue any unnecessary work of a purely munition character, and the shops were speedily transferred from a war to a peace basis

Birkenhead Omnibus Services.—The annual report of the Corporation Tramways department states that powers to run omnibuses were obtained in July, 1914, but owing to the war the service could not be started until a short time ago. After the Armistice an order was placed with Messrs. Leyland Motors, Limited, for ten omnibuses, and delivery has commenced A service between Rock Ferry and Moreton has been instituted, and as soon as arrangements can be completed with the county and district road authorities other services will be run to the surrounding districts

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FINANCIAL REPORTS AND MEETINGS.

EAST HAM CORPORATION TRAMWAYS show a deficit of £11,000. On the municipal electrical undertaking there is a loss of £9,000.

CALLENDER'S CABLE AND CONSTRUCTION COMPANY, LIMITED, has declared an interim dividend of 5s. per share, less tax, on the ordinary shares.

SHANGHAI ELECTRIC CONSTRUCTION COMPANY announce an interim dividend at the rate of 6 per cent. (12s. per share) for the half-year. A year ago the rate was 5 per cent.

BRISBANE ELECTRIC TRAMWAYS INVESTMENT COMPANY.—An interim dividend of 8 per cent. per annum (4s. per share), free of tax, has been declared on the ordinary shares for the past half-year.

NORTHERN GENERAL TRANSPORT.—The directors of the Northern General Transport Company propose to pay on September 30 an interim dividend on the ordinary shares of 2½ per cent. (6d. per share) for the half-year ended June 30 last.

LIVERPOOL CORPORATION TRAMWAYS.—At a meeting of the Tramways and Electricity Committee the chairman (Alderman E. Russell Taylor) stated that the total income had amounted to £753,113, as compared with £632,441, an increase of £120,672. On the other hand, the surplus had fallen from £117,663 in 1918, to £58,837, a sum only sufficient to make proper allowance for depreciation and renewals. As compared with 1913 the expenditure of the department had increased by 114 per cent.

NORWICH ELECTRIC TRAMWAY COMPANY.—The directors of the Norwich Electric Tramways Company announce a dividend of 2 per cent. (4s. per share), less income-tax, for year, payable November 8; £1,000 to writing down cost of turbo-generator; £547 to writing off balance of the cost of 1914 Act; £4,000 to reserve; £5,000 as provision for reconstruction and deferred repairs; £167 forward. Last year, dividend same; £7,000 to reserve; £2,000 to deferred repairs account; £1,000 written off cost of 1914 Act; £1,000 to writing down cost of turbo-generator; £117 forward.

DUNDEE, BROUGHTY FERRY AND DISTRICT.—The report of the Dundee, Broughty Ferry and District Tramways Company for the year ended July 31 last states that the profit (including £83 brought forward) amounts to £5,653. From this falls to be deducted:—Interest on debenture stock, £1,203; interim dividend on preference shares, £1,050; leaving £3,400, which the directors propose to deal with as follows:—To pay final dividend on preference shares, £1,050; dividend on ordinary shares at the rate of 5 per cent. per annum for year, less tax, £1,006; to place to reserve fund £1,000, and to carry forward £344. In moving the adoption of the report, Mr. George Balfour, the chairman of the company, said it was quite impossible for the small tramway undertakings in the country to bear any increased expenditure without an increase being made to the present maximum fares allowed by statute, and if further increase had to be borne the directors would perhaps have to take steps to apply for the necessary authority to increase the fares at present authorised in order to meet these arbitrarily increased burdens. Mr. David Hynd seconded, and the report was approved. The chairman and Mr. Edward Cowan were re-elected directors.

MANCHESTER CORPORATION TRAMWAYS.—Mr. J. M. McElroy, general manager of the Manchester Corporation Tramways, has presented a statement of results for the half-year ended September 30, 1919. It will be seen from the summary below that the estimated surplus, excluding provision for renewals, is £124,328.

	£		Pence per car mile.
Traffic revenue	799,795	...	20·139
Other revenue (rent of lines, etc.)	4,700	...	·118
Motor omnibuses (net revenue)	1,234	...	·031
Parcels (net revenue)	770	...	·019
Total revenue	£806,499	...	20·307
Traffic expenses	322,355	...	8·117
General expenses	62,115	...	1·564
Repairs and Maintenance	109,932	...	2·768
Power expenses	86,419	...	2·176
Operation expenses	£580,821	...	14·625
War service allowances	4,775	...	·120
Interest, sinking fund, etc.	96,575	...	2·432
Total expenditure	£682,171	...	17·177
Surplus (excluding provision for renewals)	124,328	...	3·130
Surplus for corresponding period last year	127,941	...	3·278
Car mileage		...	9,531,447
Corresponding period last year		...	9,366,929
Passengers carried		...	141,884,761
Corresponding period last year		...	128,448,547

The estimates prepared in April for the year ending March 31, 1920, showed an anticipated surplus for the year, excluding provision for renewals, of £201,890, but the general manager points out that owing to increased war bonus to employees it is doubtful whether this surplus will be realised. The cost of the additional wages granted to employees under the recent award amounts to about £20,000 for the half-year. For the half-year ended September the cost of renewals was £71,543, and probably double that sum will be expended in the whole year. The renewals fund at the end of March amounted to £446,479. It will be necessary for the Tramways Committee presently to review the financial position of the department, in view of the great increase in wages, amounting to £475,000 per annum, and the increased cost of materials.

PERSONAL.

Mr. S. R. Windle, of Sunderland, has been appointed electrical engineer of Doncaster Corporation.

Mr. T. Potts, who has been traffic manager of Doncaster Tramways, has been appointed tramways manager at a commencing salary of £350 per annum.

Mr. C. Hobson, charge engineer of Woolwich Council electricity works, has accepted a position with the London and South Western Railway Company.

Mr. D. Hazel has been appointed a member of the Highways Committee of the London County Council, to fill the place of Captain A. O. Goodrich, who has resigned.

Mr. W. R. Cooper has relinquished his position as editor of the "Electrician," and will continue his consulting practice as hitherto at 82, Victoria Street, London, S.W.

Sir George Touche, a director of the Anglo-Argentine Tramways Company, has been elected chairman to fill the vacancy caused by the death of Mr. J. B. Concanon.

Mr. R. O. Baldwin, manager of Exeter Corporation Tramways, has been granted an increase in salary to £400 per annum, and a further addition of £50 at the expiration of twelve months.

Mr. J. I. Newell, electrical superintendent, British Columbia Electric Railway Company, has taken over the duties of the hydro-electric engineer, succeeding Mr. F. S. Easton, who recently resigned in order to join the Mexican Light and Power Company.

Alderman J. Bowes, who has been chairman of the Manchester Tramways Committee for many years, has been nominated by the City Council to fill the vacancy on the directorate of the Manchester Ship Canal caused by the death of Alderman Sir David McCabe.

Mr. A. A. McKinstry, general manager in Australia of the Metropolitan-Vickers Electrical Company, has resigned his position as one of the Victoria Government Electricity Commissioners. He will come to England on business connected with the company.

Mr. Kennedy Jones, on the invitation of the Prime Minister and the Minister of Transport, has accepted the chairmanship of the Advisory Committee on London Traffic, which the Minister of Transport has appointed. The names of other members will be announced later.

Mr. E. S. Rayner, electrical engineer and tramways manager of Doncaster, was presented by the staff with an eight-day striking clock, and by the chief officials of the Corporation with a silver fruit basket, on leaving to take up the position of electrical engineer and tramways manager at Hull.

Mr. F. H. Edwards, of Hayle, has been appointed electrical engineer of Dartford Council at a salary of £500 a year. If required to do so, he will undertake the duties of engineer and manager of the light railways at the termination of the present arrangement of the Council with Bexley Urban District Council.

Mr. J. Makins has been appointed general manager and electrical engineer of Bexley Urban District Council Tramways at a salary of £700 a year, in succession to Mr. H. P. Stokes, who recently accepted a similar position at Plymouth. Only about a year ago Mr. Makins was appointed mains superintendent of Bexley undertaking at a salary of £300.

Mr. H. G. Jeken, engineering assistant to the Leeds City Tramways, has been appointed manager of the Middlesbrough Corporation Tramways, at a salary of £750 a year. Mr. Jeken has been connected with the Leeds tramways since the commencement of the electric service in August, 1897. During 1917-18 he was lent by the Corporation to the Admiralty, and was subsequently appointed assistant director of the Admiralty labour department at Hull.

Mr. Walter Jackson, who recently visited a number of tramway undertakings in this country, and has since contributed a series of informing articles dealing especially with the question of fares on British tramways to the "Electric Railway Journal" of New York, has resigned, after seventeen years' service with that journal. He will specialise as a consultant on electric railway fares and motor omnibus operation, and his thorough knowledge of street railway conditions, both in America and abroad, should make his advice very valuable to American street railway companies. Mr. Jackson's address is 567, Eighth Street, Brooklyn, New York.

Mr. H. P. Stokes, manager and engineer of Bexley Tramways and electricity undertakings, who was recently appointed general Manager of Plymouth Corporation Tramways, has been presented with a handsome clock and set of bronzes by the staff of the Bexley electricity and tramways undertakings. The members of the Conservative Working Men's Club gave him an illuminated testimonial, and a silver cup was presented to him by Woolwich Borough Council in recognition of his work in preparing a decorated tramcar. The presentations were made at an assembly of about 400 at Crayford, when the company bade Mr. Stokes a formal farewell. The presentations were made by Motorman C. Barcham, vice-chairman of the Employees' Works Committee, an organisation established by Mr. Stokes to enable the employees to express their views on conditions of labour. Mr. Barcham said that it was one

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of the chief ambitions of their manager to bring about amicable relations between himself and his staff, and he had cemented it together with a feeling of brotherhood. Mr. Stokes, in reply, said that he had regarded each one of them as a fellow worker. The excellent results they had achieved could not have been secured by any manager unless every individual on the job had done his bit.

Mr. W. Tuke Robson, formerly general manager of Southampton Corporation Tramways, sailed in the "Mauretania" on October 18 for a business tour in the United States and Canada. On the evening before his departure he was presented with a silver pipe case and pipe and an antique silver tobacco box as a token of appreciation and respect from the members of the Southampton Corporation Tramways Employees' Social and Athletic Club. The presentation was made by Alderman F. A. Dunsford, chairman of the Southampton Tramways Committee, who was supported by Mr. J. Dobson, the new manager, and Mr. Dixon, the works superintendent. Alderman Dunsford, speaking on behalf of the Corporation, expressed their pleasure at seeing Mr. Robson restored to health. He was sure that the cause of his breakdown was the very great stress under which he had worked during the war, and which few men could have withstood. The Southampton tramways had had more work put upon them than any other service in the country, and it was wonderful how such a splendid service had been maintained, taking into consideration the fact that the men had been replaced by women as conductors. The passengers came from all parts of the world, and even German prisoners had been carried by the tramways. It was solely owing to Mr. Robson's hard work night and day, and his personal contact with all his staff, that such excellent results had been achieved. He deplored his loss greatly, and he wished him the best of health and success in his new undertaking, and a safe return. The remarks made by representatives of both the men and women employees testified to the good relationship which existed between Mr. Robson and the staff. In a few words of farewell Mr. Robson expressed his thanks for the gifts, and his appreciation of the kind words of Alderman Dunsford. He would always remember the part the members of the staff had played in the success of the undertaking during the war. Mr. Robson was also entertained at a luncheon given by the members of the local Rotary Club before his departure. There was a large company at the quayside when the "Mauretania" left Southampton to wish him a pleasant voyage. He hopes to be in London by Christmas after an extended tour through the United States and Canada, in the course of which he proposes to inspect a large number of tramway and railway undertakings.

BUSINESS NOTICES.

The General Seating Company, Limited, have removed their offices to 162, Grosvenor Road, Westminster, S.W.1. Their telegraphic address is now "Cushioning, Churton, London," and their telephone number "Victoria, 6290 and 6291."

The General Electric Company, of New York, advise us that for the purpose of conducting their foreign business they have organised the International General Electric Company, Incorporated, with offices at 83, Cannon Street, London, E.C.4.

Mr. J. Wilkinson, tramway electrical engineer of Hull, has resigned his position and commenced business on his own account, under the name of Joseph Wilkinson and Company, consulting electrical engineers, and is dealing with light railway and tramway work and electrical vehicles.

Handley-Page, Limited, have been appointed sole agents by the Triplex Safety Glass Company, Limited, for the sale of Triplex safety glass in India, Australia, New Zealand, and South Africa. All inquiries with regard to business in these countries should now be sent to Messrs. Handley-Page, Limited, New Works, Claremont Road, Cricklewood, London, N.W.2.

The Empire Roller Bearings Company, Limited, having placed their services at the disposal of the Ministry of Munitions, and suspended their ordinary business during the war, have now resumed active operations at No. 13, Victoria Street, Westminster, and will in future be closely associated with Messrs. Ransomes and Rapier, of Ipswich and London, of which Sir Wilfred Stokes, K.B.E., is chairman. Mr. Thomas W. How, M.I.Mech.E., who has conducted the Empire Roller Bearings Company's business as managing director since it was established in 1901, will continue in that position, and will be assisted by former members of his staff now demobilised.

Peacock Brake Company.—Mr. J. McI. Cater informs us that the postal address of the Peacock Brake Company is now 43, Kensington High Street, London, W.8. (telephone number, "Western, 355"; telegraphic address, "Inbrake, Kens, London"). The number of "Peacock" brakes manufactured and sold in the United Kingdom exceeds 9,600 Owing to the great difficulty for months past in obtaining a sufficient quantity of malleable iron castings, late deliveries have been inevitable. The company is doing its best to meet the situation, and suggests that every intending buyer of "Peacock" brakes or parts should order as far in advance of their requirements as possible.

TRAMWAY AND LIGHT RAILWAY NOTES.

ABERDEEN.

Driver Falls from Car in a Faint.

While a tramcar was running along a street in Aberdeen the driver fainted and fell off, leaving the vehicle to run on. It dashed into a carriage conveying infirm children to school, with two nurses, but though the carriage was overturned, the inmates received nothing more than a severe shaking. How much more damage might have been done it is impossible to say, for a young man, who was one of the numerous passengers on the upper deck, ran down the front steps, and managed to stop the car, though quite ignorant of the mechanism.

ASHTON.

Arbitration for Purchase of Tramways.

Proceedings in the arbitration for the purchase by the Ashton Corporation and neighbouring authorities of the undertaking of the Oldham, Ashton and Hyde Electric Tramways, Limited, are to be commenced in London shortly.

AYR.

Manager's Action Upheld.

Ayr Town Council, at a recent meeting, had before them the appeal of the Tramway Workers' Union against the dismissal of a tramcar driver. After hearing the objections of the men's representative to the dismissal, and taking the evidence of a lady passenger and the tramway manager, the Council resolved to take no action in the matter, refusing to reinstate the driver.

BARROW-IN-FURNESS.

Tramway Purchase Scheme.

Following upon the resolution passed by Barrow Town Council to purchase the tramways of the town from the British Electric Traction Company, the Council instructed the tramways undertaking sub-committee and the Town Clerk to take all necessary steps to carry the foregoing resolution into effect. It was also agreed that application be made to the Board of Trade for their consent to the Corporation borrowing a sum not exceeding £120,000 in respect of the purchase and development of the undertaking authorised by the Barrow-in-Furness Tramways Order, 1884, 1894, and 1903.

BLACKPOOL.

Cost of Increased Wages.

The Blackpool Tramways and Electricity Committee have accepted the result of the recent arbitration, which will cost the department £3,200 a year. The total war advances to date aggregate £45,000 a year. Blackpool is one of the few towns in which the tramway fares have not been increased or the length of stages reduced during the war, but it is probable that a revision of fares cannot be long delayed.

BRADFORD.

More Cars Wanted—Increased Cost of Energy.

In reply to a criticism of the tramway system at a meeting of the City Council, Alderman E. Priestley, chairman of the Tramways Committee, said that it had been an utter impossibility to carry all the people who wanted to ride. The cars were packed to their utmost limit, but they were prepared to buy more cars if anybody had any good cars to sell. The committee would do all they could, because it was to their interest to get more cars and to have the public use the cars. He had been in the Council about twenty years, and such discussions as they were having had always come up before elections all those years, and they would do so until the end of the tether. Bradford Tramways Committee have agreed to pay to Bingley County Council for electricity supplied for the tramways in the Bingley area, as from March, 1919, last, 2·009d. per Board of Trade unit. The price previously paid was 1·482d.

BOURNEMOUTH.

Track Reconstruction and New Cars.

Bournemouth Town Council have adopted proposals involving an estimated outlay of about £244,000 for relaying the tramway track and the purchase of new cars, submitted by the Tramways Committee. It is estimated that the reconstruction of twelve miles of single track would cost £144,000, and in addition 2,000 tons of rails at £20 per ton would be required, making a total outlay on track of £184,000, and, besides, £60,000 would be required for new cars. The general manager, Mr. I. Bulfin, reported that balance of reserves, renewals, and other unappropriated surpluses to March 31, 1920, would provide £100,000, leaving the balance to be raised by loan. The committee recommended that tenders be invited for the work, and that application should be made for sanction to raise the loan required. After a long discussion, during which some members advocated the scrapping of the tramways and the purchase of motor omnibuses, the recommendation of the Committee was approved.

CARDIFF.

Emergency Car without Lifeguard—Tramway Extensions.

An emergency tramcar belonging to Cardiff Corporation, running without a lifeguard, knocked down a man at Treforest and killed

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him. At the inquest the jury expressed the opinion that while the driver was to be exonerated from all blame, a lifeguard on the tramcar might have saved the man's life. Directions were given by the Cardiff Parliamentary Committee recently, to the city engineer and the tramways manager, to include in the Corporation Bill powers to extend the tramways from the Crowbridge Road terminus to the junction of the road leading to Caerau at Ely, from the Whitchurch Road terminus to the North Road, from Albany Road to Newport Road, from Newport Road to Moira Place, through Fitzalan Road, and through Duke Street after its widening. The Bill will also seek powers to run motor omnibuses throughout the area which it is intended to bring within the city boundaries in order to act as feeders to the tramways

COLWYN BAY.

SUNDAY TRAMWAY SERVICE.

During the visit of the Fleet to Colwyn Bay, the Llandudno and Colwyn Bay Electric Railway Company ran a service of tramcars on the Sunday between Llandudno and Colwyn Bay for the convenience of the naval men and their friends. At the meeting of the Colwyn Bay Town Council following, the question as to the right of the company to do such a thing was raised, and it was pointed out that a clause in the agreement between the municipalities and the company expressly forbids Sunday running. After discussion, the motion that the Council protest was withdrawn, and the subject dropped.

DUNDEE.

CORPORATION PRICE FOR ENERGY DEEMED PROHIBITIVE.

The Dundee, Broughty Ferry, and District Tramways Company has given notice to terminate its arrangement with the Corporation electricity department on the ground that the proposed rate for energy, viz., 1·75d., plus 10 per cent., is prohibitive.

EDINBURGH.

HIGHER WAGES—NEW WORKSHOPS.

At a meeting of the Edinburgh Town Council on October 15, Mr. R S. Pilcher, general manager of the Corporation Tramways, reported that the actual cost of the increase to the tramway employees as a result of the recent arbitration would be £16,033. The committee approved the extension of Shrubhill workshops. The new buildings will cost £12,000, and alterations and new machines for the machine shops £3,500. In view of the expected electrification of the Pilrig and Liberton sections of the tramways, the proposed extension of the car sheds and stores at Shrubhill was delayed for further consideration.

GLASGOW.

SETTLEMENT OF WAGES DEMANDS.

Glasgow Corporation have approved generally of a settlement of the tramway men's demands, in accordance with which war bonuses or war wages will be increased by 6s. a week in the case of men over 18 years of age and 3s. to those under that age, the award of 4s. and 2s. respectively, issued by the Interim Court of Arbitration on October 7 to be merged in these advances. Women conductors and car cleaners will receive an additional bonus of 3s. per week.

HALIFAX.

PROPOSED EXTENSION.

Halifax Tramways Committee propose to obtain powers to extend their lines from Hebden Bridge to the boundary of the district at Whiteley Arches. This would shorten the missing link in the continuity of the tramways from the centre of Yorkshire into Lancashire. Another scheme which may be included in the Bill is a new line to Elland.

IPSWICH.

SAVING EXPENSE BY REARRANGEMENT OF ROUTES.

At a recent meeting Ipswich City Council adopted the report of the Electric Supply and Tramways Committee, in which a series of changes in routes and fare stages were recommended. The proposed rearrangement of the routes will, by reducing the time the cars stand at the termini, enable the ordinary service to be operated with two cars less than are now required, with a consequent saving in expense estimated at about £1,100 per annum.

ILFORD.

NEW ROLLING STOCK.

The 16 new cars which the Ilford Council have ordered on the recommendation of Mr. L. E. Harvey, the general manager, will cost £2,016 each. (A drawing and description of the cars were given in our issue of October 16.)

KIRKCALDY.

MORE EFFICIENT FARE COLLECTION.

Owing to authentic reports that half the fares of passengers on crowded tramcars are not collected, Kirkcaldy Town Council has remitted to the Tramway Committee the duty of devising a scheme for collecting the fares more efficiently.

LEICESTER.

NEW CARS AND EQUIPMENTS ORDERED.—QUEUE SYSTEM INTRODUCED.

The Board of Trade has sanctioned the borrowing of £27,000 by Leicester Corporation for the purchase of a number of cars. The Tramways Committee have decided that 18 new cars are needed. They propose to build six in the Corporation shops, for which the trucks and equipment will be purchased. The total cost of the 18 fully equipped canopy top cars is estimated at £37,566, and the committee propose that the amount of the necessary additional equipment (£10,566) shall be borrowed on the balance of the tramway revenue for the current year or from the reserve fund. The tender of the English Electric Company, Limited, for 12 cars at £2,078 each has been accepted, and also for six sets of trucks and electrical equipment at £805 per set for the cars to be built in the Corporation workshops. The queue system, which has just been introduced, was put to a severe test on a recent Saturday afternoon, when great crowds lined up for conveyance to the football grounds. The success of the experiment is described as complete, and it is expected to lead to the provision of queues at other spots.

LEEDS.

PRESENTATION TO WOMEN CONDUCTORS ON RETIRING.

Sixty conductresses, who have served on the Leeds City Tramways for three years or more, have received from the management a token of their services in the form of a brooch of silver and enamel with the Leeds coat-of-arms in the centre. These were handed to the women at an informal gathering on October 27 at the tramway offices. In the absence of the chairman, Alderman R. A. Smithson, through illness, Mr. J. Stringer Hinchcliffe, chairman of the Traffic Sub-committee, presided. Amongst others present were Mr. J. B. Hamilton, general manager, and Mr. A. Daggett, traffic superintendent. Mr. Hinchcliffe paid a tribute to the women's services, pointing out that they took up the work at a very trying time, and describing the difficulties they had surmounted. Mr. Hamilton said that in Leeds the employment of women had been undertaken with a good deal of hesitation, but in practice they had found the women as sharp as any conductors they had. He found, too, that the health of the women had improved through the open-air life.

LIVERPOOL.

SUCCESSFUL RESULT OF A DIFFICULT YEAR.

At the final meeting of the Tramways and Electricity Committee for the current municipal year, the chairman (Alderman E. Russell Taylor) described the year as one of the most famous in the history of municipal tramways. The calls of labour and the ever-increasing cost of material and overhead charges had been such that they would not find themselves in such a satisfactory position as last year. While the revenue was increasing the expenses had far exceeded any previous years. Fares had been increased, but in his opinion the situation was not fully appreciated by critics. He thought the committee were to be congratulated upon having piloted their undertaking successfully through such strenuous times. A vote of thanks was accorded to the chairman for his services during the year, and also to the deputy chairman, Alderman Fred Smith, to whom the chairman alluded as one of the pioneers of the undertaking.

NEWCASTLE-ON-TYNE.

TRAMWAY EXTENSIONS—LINKING UP NEWCASTLE AND GATESHEAD SYSTEMS.

Newcastle Corporation propose to submit to Parliament in the ensuing session a Bill, including among other things power to construct. It is proposed to link up the tramways of Newcastle and Gateshead Corporations by a double line across the high level bridge, which is owned by the North Eastern Railway Company, to lay a double line along Percy Street, and other extensions. The omnibus service scheme is to be extended to a number of outlying towns. Powers will also be sought for the acquisition of the undertaking of the Tyneside Tramways and Tramroads Company. It is not proposed to seek compulsory powers to do this, and the arrangement will be concluded only after negotiation between the Corporation and the company.

NOTTINGHAM.

PROPOSED EXTENSIONS.

Proposals of the Tramways Committee for obtaining powers to extend the Corporation Tramways to Beeston, Bucknall, and Bulwell were approved by the City Council at a meeting on October 20. Mr. R. H. Swain, chairman of the Tramways Committee, said that had it not been for the war the Beeston extension would by this time have been completed.

OLDHAM.

SUSPENSION OF SERVICE ON CHRISTMAS DAY—WELCOME TO EX-SERVICE MEN.

Oldham Corporation Tramways Committee have decided to suspend the service on Christmas Day, and to grant £75 toward the expense of a welcome home to ex-service men in the department to be held on that day. No less than 370 men enlisted, and of these 191 have returned. In addition 100 other returned soldiers are now employed.

RHONDDA.

THREATENED STRIKE AVERTED BY NEGOTIATION.

A dispute between the Rhondda Tramways Company and its employees was settled by the intervention of local leaders of the miners. A driver had been dismissed by the manager of the company for disregarding schedule time, and the men demanded his

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reinstatement, threatening to strike if their demand was refused. After prolonged negotiation, in which the miners' leaders took an active part, the driver was allowed to return to work, and a strike was averted.

SOUTHEND-ON-SEA.

FURTHER NEW CARS ORDERED—NEW CAR SHED.

The Southend Corporation proposes to purchase additional tramway cars, and is extending the existing contract with the Brush Electrical Engineering Company, who are to supply five double-deck cars in addition to the seven already ordered. A new car-shed is to be erected, subject to sanction being obtained for the necessary loan.

SALFORD.

TRAILER CARS AND MOTOR OMNIBUSES.

The Tramway Committee of Salford propose to insert a clause in the Parliamentary Bill asking for power to use trailer cars and also to run motor omnibuses in various parts of the borough. Mr. G. W. Holford, the general manager, has been directed to make inquiries with a view to the purchase of motor omnibuses.

STOCKPORT.

FREE RIDES FOR INCAPACITATED EX-SERVICE MEN.

Stockport Tramways Committee have granted the request of the League of Comrades in the Great War that incapacitated ex-service men should be allowed the free use of the car service.

SUNDERLAND.

SHORT CONNECTING LINK PROPOSED.

Sunderland Town Council have determined to relieve the congestion of tramway traffic in the principal streets by an additional short line which varies certain routes. The cost is estimated at £5,000, and application is to be made to the Board of Trade for a provisional order to authorise the work. Sunderland Corporation Tramway Department have made a truck for conveying sand from Roker to the tramway depot out of a tramcar which was shattered by one of the bombs dropped by the German airmen in the great air raid of 1916. The truck is hauled by an ordinary tramcar.

THORNABY.

A DEMAND FOR MORE CARS.

Thornaby Council has directed that representation should be made to the Imperial Tramways Company as to the overcrowding on the cars, and the need for additional rolling stock.

YORK.

NEW CAR SHED.

Application is to be made for a loan of £32,000 for the purchase of a site for the erection of a new car shed.

CONTRACTS AND ORDERS.

The Metropolitan-Vickers Electrical Company, Limited, have obtained a contract for switchgear extensions at £1,240, at Barnsley Electricity Works.

Walthamstow Light Railway Committee have placed an order for 20 tons of steel tramway rails with Walter Scott, Limited, at a price of £21 10s. per ton.

Salford Tramways Committee have accepted the tender of Hadfields, Limited, at £573 for steel tie bars, and of W. T. Glover and Company, Limited, at £338 10s. for light cable.

Wolverhampton Electricity Committee have recommended the acceptance of a tender from the British Westinghouse Company (Metropolitan-Vickers Electrical Company) for a 250-K.W. rotary converter complete with switchgear, etc., at £2,420.

J. W. Courtenay, Limited, of Amberley House, Norfolk Street, Strand, London, W.C., have been appointed sole advertising contractors for the Rotherham Corporation Tramways and the Aberdare Council Tramways. This firm are now sole advertising contractors to more than forty tramway undertakings, including nearly all the principal systems in this country.

Salford Tramways Committee have accepted the tender of Bolckow, Vaughan and Company, Limited, Middlesbrough, for the supply and delivery of 500 tons of Sandberg silicon steel tramway rails, at the price of £19 per ton, amounting to the sum of £9,500 (exclusive of the royalty payable to Mr. Sandberg); and for the supply and delivery of 250 pairs of steel fish-plates for tramway rails at the price of £25 per ton, amounting approximately to the sum of £157 10s.

Edinburgh Town Council have approved the tender of Brown, Boveri and Company, Limited, of Baden, Switzerland, for turbo-alternators for Portobello power-station, amounting to £106,518. The nearest British tender was £70,000 higher. In proposing the acceptance of the tender, Mr. Bruce Lindsay said that two of the British firms had stated that they were unable to make any reduction in the tender, and the third intimated that they could not reduce their price more than 10 per cent., and therefore made no further offer.

PATENT LIST.

Abstracted for "The Tramway and Railway World" from the Official Journal of Patents.

***** If the inventions have been communicated the names of the communicators are given in italics.**

APPLICATIONS FOR LETTERS PATENT.

The number of the patent is given in brackets.

Brake operation mechanism for vehicles (23,350)—G. H. E. Anger and J. E. Anger.
Automatically operated pneumatic wheel for motor vehicles (23,395)—H. C. Baquie.
Transmission gear for automobiles (23,280)—F. W. Berwick and Company and M. H. L. Sizaire.
Automobiles (23,628)—F. W. Berwick and Company and M. H. L. Sizaire.
Electric ignition devices for automobiles (23,629)—F. W. Berwick and Company and M. H. L. Sizaire.
Petrol tanks for automobiles (23,630)—F. W. Berwick and Company and M. H. L. Sizaire.
Lubricating devices for automobiles (23,631)—F. W. Berwick and Company and M. H. L. Sizaire.
Lifting jacks (23,626)—H. S. Buckley.
Safety lock for steering wheel of motor vehicle (23,574)—H. B. Burchall.
Driving and steering gear of motor vehicles (23,419)—C. C. Conradi and Newton Brothers.
Lifting jacks (23,698)—O. B. Davies, F. Kay, and N. Kay.
Direction indicating device for use on vehicles (23,281)—O. D. Edmonds.
Trollies for tramways, etc. (23,321)—T. G. Fox.
Electrical systems of power transmission (23,613)—British Thomson-Houston Company (*General Electric Company*).
Friction driving gear for motor vehicles (23,748)—A. G. Grice.
Motor vehicles (23,714)—A. G. Hanvey.
Motor vehicles (23,583)—E. Herries.
Trolley heads for electric tramcars (23,440)—S. K. Kirkland and H. R. Tidswell.
Lifting jack for motor cars, etc. (23,224)—C. F. McGeorge.
Gear wheels (23,692)—M. A. McLean and Metropolitan-Vickers Electrical Company.
Driving mechanism of radiator fans and water impellers for motor vehicles (23,543)—H. Morton, R. J. Sully, and E. A. Wise.
Variable speed gear (23,530)—A. R. Mitchell.
Steering heads and stub axles for motor vehicles (23,658)—W. G. Nelson.
Motor vehicles (23,402)—E. W. Shaw and Unicorn Engineering Company.
Apparatus for operating points of tramways (23,538)—C. P. Smith.
Rails for tramways, etc. (23,805)—C. Spreckley.
Device for stopping vehicles running on rails (23,427)—E. H. Wallander.
Transmission for road vehicles (23,592)—A. R. J. Wilkinson.
Front and rear wheel life guard for motor omnibuses, etc. (23,579)—D. Young.
Automatic change speed gear (23,982)—M. Chassin.
Non-skid device for motor vehicles (23,850)—A. J. Clews.
Driving gear of motor vehicles (24,155)—G. F. Dewdney.
Life guards for motor vehicles (24,134)—S. C. Durrant.
Variable speed gear (24,051)—P. W. Gray and Vickers, Limited.
Trolley adjuster (23,940)—G. MacElwee, A. Murray, and G. Murray.
Directional indicator for power propelled vehicles (24,167)—A. Matchett.
Covers for upper decks of motor omnibuses, etc. (23,875)—W. Phillips.
Brake apparatus (24,609)—Automatic Straight Air Brake Company.
Brakes and clutches (24,893)—E. A. Blackwell and A. T. Pryce.
Apparatus for operating point rails on tramway, etc., tracks (24,948)—C. Bond.
Electric traction systems having conductor rails (24,470)—Electrical Improvements, Limited, and R. Pattison.
Life guards for motor vehicles (24,434)—R. Gibson.
Undercarriages of omnibuses, etc. (24,442)—J. A. Hope.
Automobiles (24,589)—H. V. J. Jouffret.
Trolley head for electrically propelled vehicles (24,864)—J. N. Lewis.
Spring suspension for motor vehicles (24,345)—R. W. Maudslay and the Standard Motor Company.
Gearing for driving machinery of motor vehicles (24,533)—H. C. Powel.
Change speed gearing for motor vehicles, etc. (24,381)—A. Ramsay.
Change speed gears (24,855)—A. M. Rosenthal.
Variable speed gearing (24,717)—C. S. H. Snow.
Steering arrangements for vehicles (24,390)—Soc. Chiribiri and Company.
Friction variable speed gears (24,294)—C. M. C. Turner.
Variable speed gear (24,593)—F. W. Tyler.
Spikes, etc., for rail chairs (24,769)—J. Ward and W. Williams.
Railway, etc., fishplates (24,542)—D. D. Williams, L. W. Willaims, and O. R. Williams.
Railway fishplates (24,645)—G. Wilson.
Anti-creep devices or anchors for rails (24,889)—H. Yates.
Change speed gears (24,855)—F. Ahond.
Combined clutch, variable speed and differential gear (24,624)—C. Rouquet.

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Insulation and protection of live electric rails and gutters, etc. (25,487)—R. Attwater.
Mechanically propelled tip wagons (25,156)—W. T. Bell and F. J. Bretherton.
Detachable wheels for motor vehicles (25,493)—D. Beveridge, H. Coupe, J. Johnston, and A. Owen.
Lifting jacks, etc. (25,616)—H. P. L. Biggs.
Locomotives (25,028)—British Thomson-Houston Company (*General Electric Company*).
Safety locking devices for motor vehicles (25,021)—A. H. Catherwood.
Petrol tanks for motor vehicles (25,148)—J. A. Cole and Humber, Limited.
Mechanically propelled vehicles (25,393)—A. J. Roach-Cuming and B. T. Hamilton.
Indicators for travelling vehicles (25,095)—A. E. Fichardt.
Means for governing power transmission gearing (25,069)—C. E. Foster.
Lifting jacks, etc. (25,541)—A. H. F. Hern.
Driving gear for motor cars (25,354)—N. Howes.
Driving axle for motor vehicles (25,600, 25,601, and 25,602)—S. Macdonald.
Electric tramcar pole end (25,065)—S. D. Master.
Traffic signal set (25,247)—C. E. Phipps.
Electrically insulating rail joints (25,416)—W. R. Sykes Interlocking Signal Company and B. R. Wills.
Interlinking electric power stations (25,245)—A. M. Taylor.
Variable speed power transmission gear (25,157)—F. D. G. Taylor.
Wheels for trams, etc. (25,257)—T. Abbott.
Electrical equipment of motor vehicles (26,057)—R. L. Aspden and F. H. Bowman.
Tramway rails (25,842)—A. Berrisford.
Mirrors used on tramcars, etc. (26,202)—M. Boden and W. H. Matson.
Vehicle brake blocks (26,011)—J. Cunningham and Dickson and Mann.
Manufacture of tires (26,146)—Dunlop Rubber Company and C. Macbeth.
Jacks for motor vehicles (25,874)—A. E. Ford.
Gear box for motor cars (25,733)—J. E. Gill.
Liquid fuel supply for motor vehicles (26,070)—S. S. Guy.
Steering mechanism of motor vehicles (26,071)—S. S. Guy.
Automobiles (25,776)—O. A. Janemian.
Guards for tramcars, etc. (25,858)—P. C. Philipson and W. Philipson.
Automatic braking of trains, etc. (25,873)—C. W. Prescott.
Plough or current collector for conduit system of electric tramways (25,703)—H. J. E. Sayer.
Discs for wheels for automobiles, etc. (26,137)—T. A. Scully.
Steering gear for motor cars (25,980)—C. M. Shaw.
Life guards for tramways (25,717)—J. E. Stewart.

Specifications Published.

1914.
System of suspension for tramway and railway cars (2,062)—Delmez.
1917.
Electric signalling apparatus (17,011—*132,818*)—F. S. S. Wates.
1918.
Construction of bodies for omnibuses (9,474—*131,629*)—W. E. John, S. Gage, and London General Omnibus Company.
Brake shoes of tramway and railway vehicles (13,939—*131,726*)—T. C. Way.
Hauling gear of vehicles or trailers for tramways and like systems (21,536—*131,810*)—C. Hanks and G. Cousins.
Steering mechanism for road vehicles (11,001—*131,967*)—R. C. W. Horsley.
Brakes for railway and road vehicles (14,754—*132,054*)—S. T. Tregaskes.
Mechanism for transmitting motion in motor driven vehicles (14,430—*132,318*)—T. F. Evans.
Suspension and power transmission mechanism of automobile vehicles (15,099—*132,363*)—F. W. Lanchester.
Apparatus for electrically operating and controlling railway points (15,178—*120,553*)—A. Monard.
Electrically driven vehicles (20,411—*132,413*)—J. E. Stott.
Change speed and reversing gears (21,661—*132,420*)—A. Huart.
Lifting and manœuvring appliances for motor road vehicles (14,945—*132,594*)—E. Jensen-Valeur.
Variable speed transmission (15,692—*132,628*)—W. Dunn.
Mounting of driving road wheels on motor vehicles (17,114—*132,657*)—W. J. Thomas and E. G. Wrigley and Company.
Means for supporting overhead conductors on tramways and railways (20,285—*132,681*)—E. H. Whittall and B. J. Rees.
Device for the suppression of the violent rebound of the suspension springs of motor vehicles (16,501—*132,907*)—W. J. Storey.
Electrically propelled vehicles (19,247—*132,938*)—J. P. Kemp and F. V. Bornand.
Driving wheels for motor vehicles (19,321—*132,939*)—P. G. Beremand.
1919.
Change speed gearing (239—*131,816*)—M. Rose.
Train control and signalling systems (9,820—*132,199*)—L. R. Wilder.
Signalling apparatus for trains, etc. (7,012—*132,453*)—J. J. Daniels.
Multiple control apparatus for electric railways with motor driven main switch drums (8,200—*126,278*)—Akt.-Ges. Brown, Boveri et Cie.
Omnibus construction (8,625—*132,459*)—W. J. Hickman.
Apparatus for heating tramway and railway cars (11,500—*132,752*)—J. Charpentier.

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TRAFFIC RETURNS.

Tramway and Omnibus Undertakings in the United Kingdom.

NAME OF COMPANY OR CORPORATION.	1918. WEEKS ENDED.					1919. WEEKS ENDED.					AGGREGATE.		
	Oct. 5	Oct. 12	Oct. 19	Oct. 26		Oct. 4	Oct. 11	Oct. 18	Oct. 25		Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Aberdare U.D. Council	511	506	520	495	...	588	603	522	536	...	29	16,039	+ 1,353
Aberdeen Corporation	2,603	2,567	2,483	2,303	...	3,219	3,263	2,996	3,030	...	20½	71,135	+ 15,379
Ayr Corporation	551	430	407	382	...	561	497	482	501	...	23	21,023	+ 3,697
Belfast City Tramways	9,081	9,025	8,941	8,763	...	10,397	10,274	10,274	10,605	...	30	310,446	+ 67,843
Birkenhead Corporation	2,244	2,186	2,163	2,099	...	3,725	3,089	3,014	2,962	...	29½	87,692	+ 20,926
Birmingham Corporation	23,971	24,766	24,661	24,834	...	27,653	26,466	25,486	26,485	...	30	772,533	+ 65,020
Birmingham Motor Buses	1,338	1,389	1,400	1,355	...	1,937	1,777	1,597	1,682	...	30	52,745	+ 7,296
Blackburn Corporation	1,778	1,598	1,797	1,931	...	2,621	2,408	2,016	2,197	...	30½	72,324	+ 16,117
Bradford Corporation	9,693	10,534	9,830	9,438	...	13,177	11,544	11,964	11,166	...	30	346,587	+ 66,229
Burnley Corporation...	2,371	2,377	2,356	2,670	...	3,384	3,202	2,896	3,033	...	—	—	—
Burton-on-Trent Corporation ...	421	415	406	366	...	505	519	491	499	...	30	15,167	+ 2,736
Bury Corporation	2,011	2,076	1,990	2,109	...	3,058	2,281	2,192	2,212	...	30½	73,337	+ 20,318
Chatham and District	1,282	1,302	1,301	1,215	...	1,482	1,506	1,455	1,451	...	42	64,757	+ 8,990
Cork Electric	594	588	564	573	...	860	878	766	821	...	42	29,745	+ 3,099
Derby Corporation	1,487	1,514	1,498	1,486	...	1,893	1,966	1,899	1,928	...	30	58,569	+ 12,817
Dundee City	1,980	1,928	1,920	1,873	...	2,663	2,755	2,430	2,452	...	22½	59,539	+ 14,450
East Ham Corporation	1,481	1,663	1,703	1,486	...	2,478	2,127	1,835	1,842	...	29½	58,274	+ 11,816
Edinburgh Corporation	8,993	8,849	8,577	8,558	...	11,312	10,813	10,181	10,483	...	16½	193 981	+ 37,811
Glasgow Corporation	29,926	27,792	28,271	28,434	...	36,605	33,520	32,886	33,281	...	21	684,142	+ 79,686
Glossop (Urban Elec. Supply Co.)...	168	174	166	171	...	267	228	208	221	...	43	9,652	+ 1,875
Huddersfield Corporation	3,689	3,779	3,774	3,666	...	5,311	4,816	4,688	4,801	...	30	148,653	+ 32,606
Ilford U.D. Council	980	1.000	978	882	...	1,309	1,179	1,082	1,145	...	29½	36,480	+ 6,210
Ipswich Corporation	723	727	667	616	...	847	879	846	871	...	30	28,985	+ 5,009
Isle of Thanet	388	353	316	306	...	1,212	790	638	687	...	3½	2,261	+ 1,177
Kilmarnock Corporation	267	261	252	259	...	295	278	277	278	...	23½	6,778	+ 743
Lanarkshire	4,065	3,488	3,666	3,618	...	5,316	4,488	3,860	4,127	...	42	156,633	+ 3,693
Leeds City	14,391	14,367	14,435	13,617	...	17,729	16,227	15,826	16,002	...	30	502.482	+100.177
Leicester Corporation	4,675	4,775	4,560	4,214	...	5,831	6,326	5,926	6,023	...	—	—	—
Leyton U.D. Council	2.438	2,526	2,442	2.209	...	3,915	3,675	2,860	2,862	...	30	95,721	+ 25.998
Liverpool Corporation	19,155	19,181	19,098	18,751	...	27,382	24,822	23,978	24,471	...	42½	948,556	+173,677
London County Council	67,391	68,912	69,036	63,499	...	91,847	91,297	75,744	76,109	...	29½	2.385,753	+468,387
Maidstone Corporation	360	261	269	237	...	475	401	356	382	...	29½	11,971	+ 3.265
Manchester Corporation	27,526	27,678	28,107	27,291	...	32,796	30,733	29,601	30,383	...	30	918,544	+142,070
Newcastle-on-Tyne Corporation ...	9,506	9,318	9,275	9,522	...	10,516	9,313	9,108	10,435	...	29	287,672	+ 13,307
Northampton Corporation	827	813	813	782	...	1,140	1,152	1,156	1,247	...	30	38,213	+ 12,321
Nottingham Corporation	5,723	5,725	5,873	5,700	...	7.748	7,937	7,003	7,271	...	30	215,023	+ 41,135
Oldham Corporation	3,406	3,669	3,488	3,489	...	4,955	4,556	4,390	4,363	...	31	138,915	+ 29,718
Reading Corporation	1.291	1,296	1,303	1,223	...	1,546	1,515	1,467	1,487	...	30½	47,975	+ 8,300
Rhondda Tramways	...	...	...	...	...	...	...	...	...	...	—	—	—
Rotherham Corporation	2,613	2,593	2,591	2,508	...	2,344	2,336	2,076	2,086	...	29½	62,302	— 7,104
St. Helens Corporation	...	...	...	...	...	...	2,014	1,569	1,633	...	3	5,216	—
Sheffield Corporation	13,841	13,852	13,505	13,097	...	15,800	16,376	16,288	16,414	...	30½	504,222	+ 88.798
Southampton Corporation	2,475	2,452	2,409	2,358	...	2,546	2,518	2,375	2,465	...	29½	81,210	+ 4,533
Southampton Motor Buses	...	...	...	...	...	...	108	136	189	...	12	1,437	—
Southend-on-Sea Corporation ...	1,230	1,140	1,042	974	...	1,897	1,675	1,437	1,550	...	30	71,556	+ 28.819
South Shields Corporation... ...	1,164	1,152	1,121	...	...	1,484	1,409	1,391	...	...	29	41.690	+ 7,683
Sunderland Corporation	2,189	2,348	2,283	2,279	...	2,743	2,682	2,659	2,689	...	30	87,832	+ 23,545
Swindon Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
Tyneside Tramways and Tramroads	993	940	993	897	...	2,000	1,791	1,019	1,684	...	17	21,983	+ 3.678
Wallasey Corporation	1,673	1,681	1,642	1,554	...	2,485	2,399	2,245	2,336	...	29½	78 949	+ 20,840
Walsall Corporation	1,221	1,267	1,302	1,255	...	1,728	1,657	1,592	1,615	...	30	43,958	+ 6,708
Walthamstow U.D. Council ...	1,348	1,406	1,373	1,242	...	1,836	1,653	1,488	1,500	...	30	53,101	+ 8,977
Warrington Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
West Ham Corporation	4,740	4,683	4,524	4,232	...	6,753	6,428	4,957	5,066	...	29½	161,722	+ 26.750
Wolverhampton Corporation ..	1,677	1,724	1,639	1,751	...	2,079	1,863	1,988	1,860	...	30	61.381	+ 8,807

*** A number of undertakings suspended the issue of traffic returns for the duration of the war.

Colonial and Foreign Tramway Traffic Returns.

NAME OF COMPANY.	1918. WEEKS ENDED.					1919. WEEKS ENDED					AGGREGATE.		
	Oct. 5	Oct. 12	Oct. 19	Oct. 26		Oct. 4	Oct. 11	Oct. 18	Oct. 25		Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Anglo-Argentine	57,622	61,188	58,790	55,070	...	60,956	70,321	69,079	66,846	...	42	2,428,631	+ 83 040
Calcutta ... ... Rs.	82,771	82,232	74,662	66,380	...	92,175	76,152	82,658	79,924	...	42½	—	+473,381
Madras ... ... Rs.	...	(2 weeks)	39,924	...	...	...	(2 weeks)	47,890	...	...	41	791,902	+ 70,602
Pernambuco	4,211	2,983	3,101	3,524	...	5,870	6,045	6,119	6,059	...	42½	223,528	+ 37,138

Companies issuing Monthly Statements only.

	1918.						1919.						Wks.	AGGREGATE.	
	May	June	July	Aug.	Sept.	Oct.	May	June	July	Aug.	Sept.	Oct.		1918-19.	+ or —.
	£	£	£	£	£	£	£	£	£	£	£	£		£	£
Ballarat & Bendigo	3,286	3,076	2,948	2,996	...	...	3,266	3,261	2,981	2,192	...	...	20	15,991	— 410
Brazilian Trac. Mlrs	9030000	9087000	9465000	9491000	9081000	...	9562000	9369000	1007000	9734000	9792000	...	39	83,559,000	+5.829,000
Brisbane	...	...	36,360	42,670	35,400	...	...	...	41,610	42,245	41,970	...	39	346,370	+ 20.516
British Columbia $	486,876	488,873	413,968	544,339	575,476	...	628,947	411,605	642,090	667,170	684,946	...	13	1,994,206	+ 460.423
Buenos Ayres L'c'z.	41,315	38,375	41,145	40,006	...	41,843	47,317	61,356	45 222	45,310	...	49,692	17	187,070	+ 21,258
Burma	29,019	31,158	34,848	41,855	30,836	...	38,900	41,518	44,045	43,683	43,152	...	8	86,835	+ 14.144
Cape Town	...	17,612	18,409	...	...	...	23,405	22,432	12,792	...	19,759	...	—	—	—
Carthagena & H....	5,027	5,047	5,491	2,729	2,549	2,525	3,226	3,373	4,183	2,991	1,539	1.465	43	26,969	— 13,957
East India	1,920	1,754	1,968	1,975	1,939	2,044	2,131	2,323	2,687	2,761	2,831	2,855	13	8,447	+ 2,489
Kalgoorlie	2,767	2,747	...	...	...	...	2,796	2,646	...	...	...	...	26	15,842	— 143
La Plata	5,105	5,135	6,721	4,382	4,999	...	5,702	5,105	5,317	5,729	5,540	...	39	51,043	+ 4,722
Lima	42,949	42,161	45,964	...	...	...	42,968	47,811	49,025	...	...	...	30	331,932	+ 29,748
Manila ... $	175,500	183,250	189,800	200,000	...	...	183,050	160,670	189,573	193,841	...	...	35	1,610,149	+ 170.284
Monte Video ...	32,301	30,503	31,684	16,937	29,611	...	37,382	34,650	34,139	34,873	35,552	...	47	404,501	+ 57,428
Para	24,925	25,445	24,398	24,672	23,442	...	24,503	24,647	24,659	24,890	24,386	...	43	246,012	+ 3.964
Peruvian ... $	...	...	987,300	...	...	...	...	...	1058730	...	...	...	—	—	—
Port Elizabeth ...	...	5,404	3,395	...	...	...	5,145	4,868	3,247	...	4,372	...	—	—	—
Rangoon	5,719	6,163	6,054	5,760	6,067	...	6,533	6,276	6,562	6.472	6.812	...	39	58,472	+ 2,892
Toronto ... $	1090747	1035932	1049936	1070567	1119925	...	1032717	842,697	977,262	1083741	1124159	...	39	9.318,458	— 278.139
Winnipeg ... $	280,935	293,140	288,155	288,974	285,670	...	248,191	112,615	337,978	353,194	381,248	...	39	2,947,060	+ 272,923

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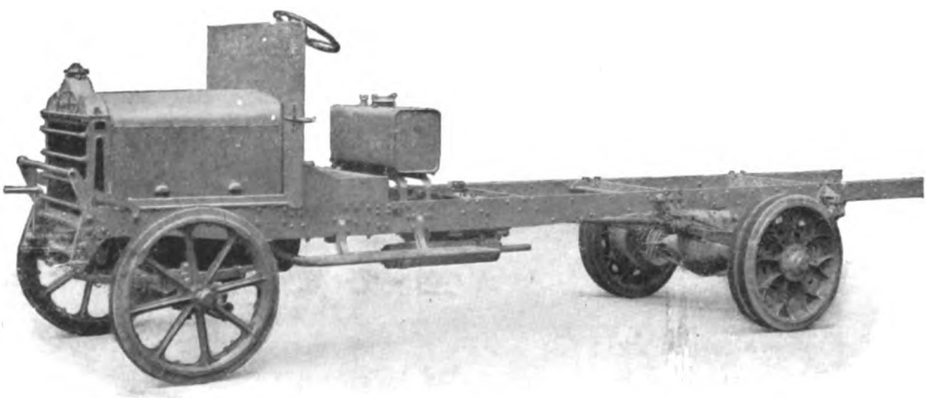

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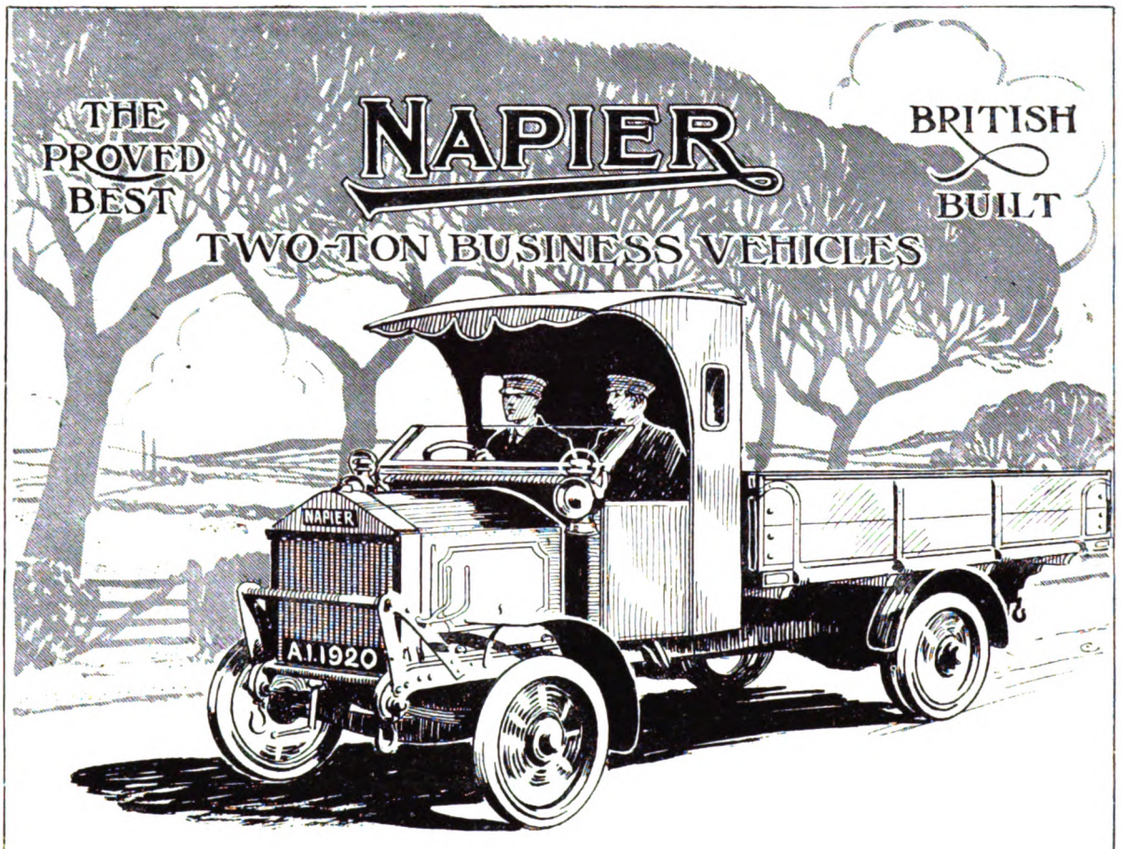

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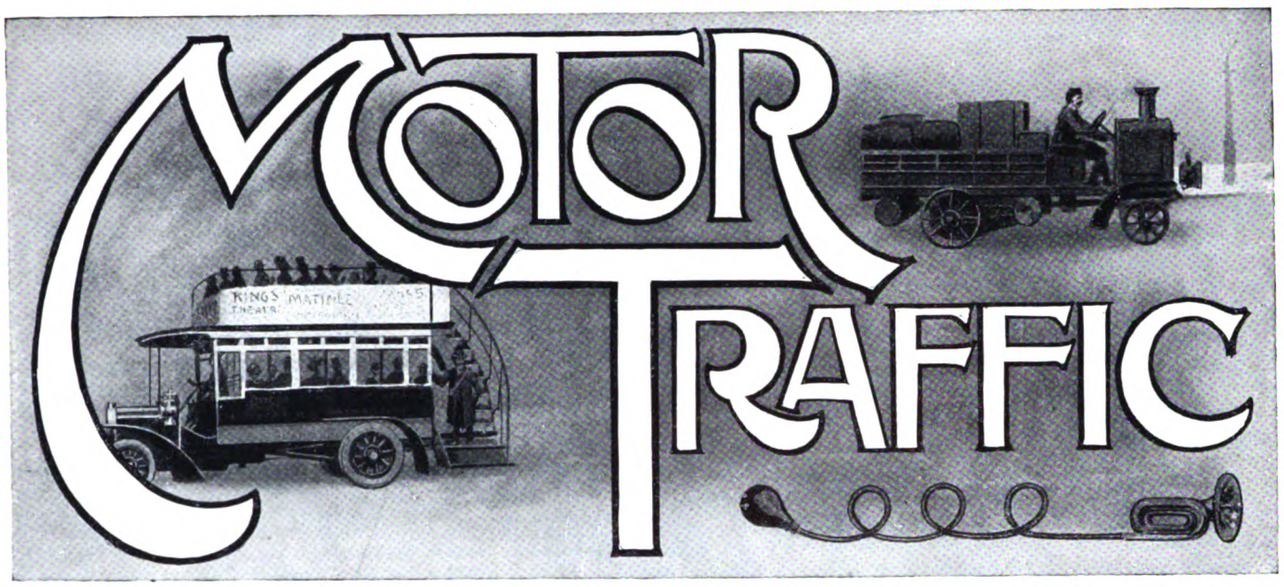

THIS YEAR'S MOTOR EXHIBITIONS.

The Olympia Show of this month was, of course, devoted to private motor cars to the exclusion of commercial vehicles, but a fairly complete selection of the latter will be on view at the Roads and Transport Exhibition, which will be held at the Agricultural Hall, from November 20 to 27. The exhibits there are intended to appeal particularly to local authorities, and such things as tipping wagons, road sweepers, watering carts, and tractor combinations will therefore be prominent. The fact remains, however, that the chassis is to all intents and purposes the same, whether the complete vehicle is destined for municipal service or for general haulage, or for the carriage of passengers. The Congress that takes place concurrently with the Exhibition should be of great interest to all who are concerned with the improvement of roads and of the traffic that runs upon them. It is expected that Sir Eric Geddes, who is acting as President of the Congress, will make a statement which will throw considerable light on the programme of the new Ministry of Transport. In general scope the recent Paris Motor Exhibition differs from the Olympia Show, inasmuch as commercial vehicles were included with private cars. Paris is fortunate in having a really adequate exhibition building, but it is questionable whether, even if the thing is possible, it is desirable to mix these two distinct classes of motor vehicle. An exhibition of motor cars forms a big public attraction which draws large crowds, and this is not conducive to the solid business conversations that are necessary in connection with the discussion of the merits of commercial vehicles. The atmosphere that is right for the one is wrong for the other. Moreover, in the Paris Show the commercial vehicle occupies a somewhat secondary position, which does not really give a fair idea of the importance of motor transport, though perhaps it helps to bring home the fact that for various reasons we, in this country, make more use of motors for haulage than do our neighbours across the channel.

* * * *

WHERE GREAT BRITAIN SCORES.

Some of the daily papers have recently commented on the fact mentioned just above, and expressed curiosity as to the underlying cause. This is mainly connected with the distribution of population. In France the business man usually lives in the town near his business. In England he frequently lives well out into the country. The population of London is both greater and more thinly spread than that of Paris. For both reasons distances are longer between points which have to be connected by road transport. In Paris, distances as a rule are not beyond the reasonable capacity of horsed vehicles. In the London area the opposite is the case. In bringing about the general use of motor transport in this country, the large retail shops of London and other big centres have done valuable pioneering and demonstration work. They have been induced to do so because so many of their clients live at distances which make them inaccessible for direct deliveries by horse. Delivery to the railway and subsequently from the railway by horsed vehicle is a slow job frequently involving delays. Consequently, when distances are too great for that form of delivery, the motor van is able to give immensely better service. Directly a few traders have demonstrated this and convinced their clients of it, others have to follow suit, or else to lose their outlying business. Thus, the general use of motor vans in the large centres is encouraged, and this in turn forces the hand of traders in similar centres who find their own area encroached upon. In the light of these facts, no further explanation is necessary of what at first appears the curious phenomenon that we are so far ahead of our progressive neighbours, the French, in the development of motor transport.

PARIS OMNIBUS SERVICES.

As regards public service vehicles for the carriage of passengers, Paris is for its size as well supplied as London. The motor omnibuses, which are all owned by the Paris General Omnibus Company, are of a different type, being of the long single-deck variety. The interior is divided into two compartments—first and second class—and there is a rear platform for about eight standing passengers, giving a total accommodation for about 36. The Paris Omnibus Company is more fortunate than omnibus proprietors of London, because by its concession from the municipality of Paris it is protected from competition. Its monopoly is, of course, contingent on the provision of scheduled services, the payment of employees on an agreed scale, and the use of vehicles of an approved type. Furthermore, the company holding the monopoly makes a substantial annual payment to the municipality, which thus definitely assures a profit to the ratepayer in respect of the operation of public service vehicles. The fares charged are, of course, regulated. The system works well, and by it the ratepayer is guaranteed against financial risk, while he has the assurance that

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really essential routes will be properly served. Another point about the Paris omnibus system worth recalling is the provision of simple means to ensure that waiting passengers shall obtain seats in proper rotation. This method has been in use for many years. It is carried out by the provision of packets of numbered papers at the stopping points. Each intending passenger tears off one of these papers, and those who are waiting are admitted to the available seats in the order of the numbers they hold. The plan appears to be one that could well be used to advantage at certain points in London and other towns, though it would not be suitable for some of the most crowded points in London. Something of the kind is particularly necessary now that there are so many crippled men, who cannot fight for seats amongst an uncontrolled crowd. The new Chief Commissioner is introducing a number of reforms in police administration, and if he were to personally investigate this matter of a trial of the Paris system, there is reason to think that he would consent to experiments being made at several points. For this purpose, Trafalgar Square, Parliament Street, and Hammersmith may be suggested.

THE STRIKE AND ROAD TRANSPORT.

The railway strike taught the country many valuable lessons. Among the greatest was the enormous utility and versatility of motor transport. Although a small minority were already enlightened on this point, the great majority looked on the motor vehicle as a comparatively unimportant adjunct to the railway system. During the strike a great educational demonstration was carried on under the nose of the majority of the population. To ensure the milk supply of London alone upwards of a thousand motor lorries were employed. These were organised into convoys serving the various districts usually served by the railways. The supplies were brought into Hyde Park and thence distributed in detail. The organisation was created within a few hours and became efficient almost immediately. Its promptness and efficacy had a great influence in shaking the confidence of those who had hitherto believed that a suspension of the railway service would bring the nation to its knees by means of food shortage within a few days. The public was grateful to the motor vehicle and reconsidered its old hypercritical attitude, even going rather too far in the opposite direction.

CARRIAGE OF PERISHABLE SUPPLIES.

What the motor vehicle really did in the strike was to demonstrate its ability to undertake at short notice the carriage of the perishable supplies upon which the community is dependent, but which cannot through their nature be stored in very large quantities and for any great length of time. What it did not do was to demonstrate its ability to supersede the railway system. During the strike vast quantities of goods accumulated at the docks and elsewhere for lack of haulage facilities. In time, the motor organisation might have been increased to deal with at least a large part of this accumulation. Nevertheless, no man capable of forming a sound judgment would argue that the railways are becoming obsolete and the motor will take their place. The motor vehicle as a unit is too small to give the maximum economy when very large and heavy loads of comparatively low-priced goods have to be carried. It is superior to the railway in its ability to deliver direct from door to door. It is inferior in its cost per ton mile, even if we disregard the increased expense of maintaining the roads if they were called upon to carry the goods that now go by rail. While motor transport has shown that it can be used advantageously for much bigger jobs than it has hitherto tackled in civilian life, in most cases, however, it cannot advantageously replace the railway unless there are some special circumstances connected with the nature of the load or the urgency of its delivery. When materials are required with the greatest possible urgency, it may be worth while to pay more to have them brought by road rather than to suffer the indirect loss due to their delay. If the goods to be carried are perishable, their value decreases with the time spent on the journey and with every handling that is necessary on the way. Soft fruit may be taken as a glaring example. It is better to pay a higher price for transport and get a higher price for the produce than to save on one only, to lose equally on the other. In the present state of the country's finances nobody can afford to squander valuable natural produce, yet this is done whenever unnecessary deterioration takes place as a result of delay in transport.

COMPARATIVE COSTS.

From the argument above, it is clear that the advocates of motor traction must avoid falling into either one of two errors. One is the unwarranted assertion that such transport is cheaper and better than railways as a general proposition; the other is that in every instance motor transport can only show its superiority by being cheaper. The fact of the matter is that speed, leading to the prompt conclusion of the journey, results in a saving of time, which is equivalent to some saving of money. The value of time expressed in money is a variable. When it is very great, direct haulage on the road is almost always preferable, providing the distance between the terminal points is small or moderate. On very long journeys the railway may well have the advantage, particularly if the trader is prepared to pay for express delivery. At the other end of the scale there is plenty of heavy and bulky stuff requiring transport, the time of delivery making little or no difference to the value. Here haulage in bulk on the railway is evidently advantageous —especially if distances are great. It will best conduce to progress if, as a consequence of the railway strike, the trading community recognise that, while railways are still necessary, a far more extensive employment of motor transport is justifiable for local collection and local distribution, particularly of perishable articles and even for through transport of very perishable supplies which are liable to damage from handling at intermediate points.

INCREASED PASSENGER ACCOMMODATION IN LONDON.—The Underground Group announced on October 10 that there were 859 more omnibuses running in London than at the date of the Armistice. The speeding up of the Underground lines has been responsible for an increase in the daily car mileage of 44,414, and the London United and Metropolitan Electric Tramways have added 82 cars to their running fleet. The result of these improvements is that accommodation is provided for over 1,000,000 more passengers daily. An announcement issued on October 23 stated that the increase in the number of omnibuses was 866, viz., from 1,758 at the Armistice to 2,624. In this number are included 143 lorry omnibuses in daily service, which are run at a loss of 5d. per mile, representing in a week a sum of approximately £1,700.

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POSSIBILITIES OF FURTHER ECONOMIES IN ROAD TRANSPORT.*

By Mr. T. Clarkson, M.Inst.C.E.

WAR WORK OF THE INSTITUTION.

As this is the first presidential address to be delivered since the conclusion of the great war, it is fitting that reference should be made to the work carried on by the Institution during this momentous period, and also to the individual services of members in this war between engineers. The records of the proceedings of the Institution show what it has achieved during the war, and how its activities have been maintained, notwithstanding the exceptional difficulties of the time. It may be claimed that the contribution of the Institution dates from long before the war in its work of developing the science of mechanical transportation.

It is not surprising that members of this Institution have had so large a share in the creation and development, among others, of three of the most important war services, namely, mechanical transport, the aeronautical arm, and the tanks. The war conditions have certainly proved that the Institution of Automobile Engineers is entitled to a place in the front rank of the engineering societies of this country. It was the privilege of one of our members to organise and inspect mechanical transport on no less than seven fronts. Truly a colossal task.

Some farseeing members who were responsible before the war for the evolution of military transport, quietly conducted trials, and prepared plans, so that details of the best types of military vehicles were settled in advance ready for the enormous expansion which was necessary.

In the early days of the war, before the standardised types of military vehicles had been produced in sufficient quantities, a large number of commercial motor vehicles was collected from all over the country, and taken over for national service. Naturally these vehicles were of many different types and degrees of efficiency, and it does not appear that justice has ever been done to the work of those who were responsible for the organisation and maintenance of such a fleet.

Consider for a moment the problem of providing spare parts for this fleet. The Director of Supply could easily order for the use of the troops 100 tons of fish of various kinds, but the same simple plan could not be followed by the transport officer in ordering spare parts for this heterogeneous fleet of vehicles. The problem affected not only the provision of spares and stores, but their distribution over the various military areas, and also provision for the rapid movement of these stores to other bases, as might be necessitated by military conditions. The provision of adequate mechanical transport in all the theatres of war is recognised as one of the greatest achievements of this momentous period.

I would like also to refer to the work of one of the past presidents of this Institution in creating and directing the Aeronautical Inspection Department, a national work of the greatest importance in furthering the rapid development of our air forces.

There has been much written and said concerning the origin of the tank service, which did so much to secure victory. It may here be recorded that the preliminary researches and investigations, naturally precedent to the preparation of plans and designs of this new weapon, were directed by members of this Institution, and for the subsequent development in the evolution of this arm other members were chiefly responsible.

Sufficient has probably been said to indicate the nature and extent of the contribution of the Institution and its members to the national victory. Wherever the activities of war engineering were in progress there would be found the ubiquitous member of the I.A.E., quietly and unostentatiously "doing his bit" in directing, organising, inspecting, maintaining, designing, or producing. We remember with pride and satisfaction that the services of many members have been officially recognised by H.M. the King, whose keen interest in engineering matters is so well known and appreciated. To the memory of those members who have made the supreme sacrifice we unite in paying a generous tribute of admiration and respect.

Post War Problems.

In the development of peaceful industry we are met at the outset with the abnormal and difficult conditions of life resulting from the war. The cost of commodities is higher, and as a result wages are advanced. The advance in wages reacting on cost of production still further advances the price of commodities, and so the vicious circle revolves in the direction of national ruin and bankruptcy unless a way out can be found.

Here the automobile engineer may be able to render valuable aid by devising means of reducing the cost of road transport. No greater service can be rendered to the community than by reducing the cost of road transport. I place emphasis on road transport because I believe that, notwithstanding the development of other forms of inland transport (aerial, canal, and railway), it is chiefly to the commercial motor vehicle that we must look for the solution of inland transport problems.

Transport is a master key industry, since not only are all other industries dependent upon it, but actually there is no part of the national life which is not affected by efficiency of transport. Transport being a master key industry, it naturally follows that a reduction in the cost of transport confers an immediate advantage upon the whole industrial life of the nation.

To the uninitiated it will scarcely be realised what is the significance of a penny per vehicle mile in the cost of transport. It is not without reason that large motor transport organisations have found it necessary to analyse their working costs in the greatest detail to 1,000th of a penny per mile. One penny a mile reduction in the cost of operating London's fleet of motor omnibuses would represent an annual saving of about half a million pounds. It is certain that a reduction in the cost of road transport would be felt appreciably in quickening the industrial life of the community, and in enabling operations to be conducted profitably, which with dearer transport could only be done at a loss.

The question is *how can a substantial reduction be made in the cost of road transport?* I hope to indicate some possible clues to a solution. In analysing costs we cannot obtain better information than by an examination of the operating expenses of a London Omnibus Company. The omnibus service of London is probably the most perfectly organised road transport service in the world. It is certainly the most strenuous, for each vehicle does over 30,000 miles per annum, with frequent stoppages inherent to the service.

Schedule of Working Expenses.

1. *Administration Expenses.*
   - Carriage.
   - Incidental expenses.
   - Legal charges.
   - Office rent, rates, etc.
   - Postages.
   - Printing and stationery.
   - Salaries.
   - Travelling expenses.
2. *Annual Overhaul of Vehicles.*
   - Material.
   - Wages.
3. *Depreciation.*
   - Omnibuses.
   - Sundries.
4. *Garage Expenses.*
   - Cleaners.
   - Cleaning and testing.
   - Clerical.
   - Labour.
   - Lighting and water.
   - Rates and taxes.
   - Rent.
   - Repairs.
   - Upkeep of service cars and lorries.
   - Waste, files, etc.
5. *Traffic Expenses.*
   - Accidents.
   - Conductors.
   - Drivers.
   - Fuel.
   - Inspection.
   - Insurance.
   - Labour.
   - Learners.
   - Licences.
   - Lubricating oil.
   - Punches.
   - Supervision.
   - Tires.
   - Uniforms.
   - Way bills and tickets.
6. *Maintenance of Cars.*
   - Wages.
   - Materials.
7. *Wages of Repairs to Chassis.*
   - Supervision.
8. *Management.*

Having regard to the state of flux in which we are living, both for materials and labour, it is impossible to give accurate figures for each of these items.

Wages.

Approximately direct wages absorb about 40 per cent. of the expenses. Control of wages may be regarded by some as outside the sphere of the automobile engineer, but it is very desirable that any engineer in charge of a motor undertaking should be in sympathy with labour, and should give close attention to the matter of wages and conditions of supply, otherwise he finds himself left in the hands of labour extremists who try to create discontent amongst employees, very often much to their disadvantage. Some of the demands as to conditions of employment are inconsiderate and unreasonable. Labour does not seem to understand the limitations set to the successful operation of public services, and it appears to be the wise thing for us to inquire into the source and support of

* Abstract of Presidential Address to the Institution of Automobile Engineers on October 22.

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this unhelpful, irrational, and obstructive spirit. Much is probably due to defects in the elementary education of our workers. We have left these matters to other classes and other interests, and we find ourselves confronted with an active generation mistrustful of us, and blankly ignorant of business conditions and economic laws.

Wages of motor transport workers have been successively advanced during the war in order to meet abnormal conditions. Not only have wages been increased, but hours have been reduced, and yet further demands are made, not, I believe, by the workers themselves, who know they are well paid, but by other parties, who act upon the assumption that there is no limit to the "squeezability" of the transport industry. No sensible person objects to workers being paid so that they may live comfortably, and have leisure for recreation and improvement. When these advantages are secured, any further advance is an unfair tax upon the rest of the community, and should be resisted like any other form of profiteering. We have a reasonable claim that the Press shall play a larger and a better part in the spread of information and right ideas about economic conditions.

Fuel.

After wages the most important item of expense in road transport is fuel. First, there is the natural division of fuels which are suitable for internal or for external combustion; and, secondly, fuels of foreign or domestic origin.

Of fuels suitable for internal combustion we have liquid and gaseous hydrocarbons, including—

Fuel.	Origin.	Calorific Value in B.Th.Us.	Approximate B.Th.Us. per Penny.
Petroleum spirit ...	Foreign	18,000 per lb.	4,500
Alcohol	,,	12,400 ,,	1,500/3,000
Paraffin	,,	19,000 ,,	10,500
Benzole	Domestic	17,300 ,,	4,800
Coal gas...	,,	500 per cub. ft.	8,300

Of fuels suitable for external combustion we have the following solids and liquids—

Fuel.	Origin.	Calorific Value in B.Th.Us.	Approximate B.Th.Us. per Penny.
Anthracite	Domestic	15,000 per lb.	46,500
Coal	,,	14,112 ,,	52,300
Coke	,,	12,000 ,,	57,600
Lignite	,,	7,200 ,,	—
Creosote oil	,,	16,050 ,,	20,600
Charcoal...	,,	12,000 ,,	—
Heavy petroleum ...	Foreign	17,390 ,,	22,700

The number of B.Th.Us. obtainable for a penny is, of course, subject to market fluctuations. Some of the fuels in the second category may be adapted for internal use by a partial external combustion in a gas producer.

As an illustration of the increasing consumption of motor spirit, the following figures, relating to the U.S.A., are significant—

The consumption in 1915 was 200,000,000 gallons over 1914.
,, 1916 ,, 280,000,000 ,, 1915.
,, 1917 ,, 640,000,000 ,, 1916.
,, 1918 ,, 360,000,000 ,, 1917.

A total increase of 1,480,000,000 gallons.

The check in the rate of increased consumption recorded for 1918 is explained by the ban on joy-riding due to the war; but for this abnormal condition it is probable that the increase for 1918 over the previous year would have been nearer 800,000,000 gallons. I have no figures to show the increase in the world's production of motor spirit during this period, but it is significant that the price of spirit has advanced concurrently about 200 per cent. This is a very disturbing fact to automobile engineers, and one which accentuates the urgent need for taking all possible steps to encourage the employment of other fuels.

One result of the war has been the development of benzole recovery from coal and shale distillates at by-product recovery ovens and at gas works to the extent of some forty-two million gallons per annum. Used merely as a motor spirit, the present contribution to the fuel resources from this source is relatively insignificant; in fact, sufficient only to meet the new demand due to a few weeks' output of Ford cars alone.

Benzole, however, has an economic value far greater than its mere intrinsic fuel value, and its present use undiluted illustrates the need for a policy which would ensure its utilisation to the best possible advantage. Considerable economies are possible by its judicious use as a diluent with petrol, and that as an admixture the use of alcohol as fuel for existing types of internal combustion engines, which otherwise is largely impracticable, becomes possible, and a very important alternative source of fuel supply may thus be opened up.

Of fuels produced in this country, the greater part are not suitable for internal, but for external, combustion, and it will be noted from the column giving the approximate number of British thermal units obtainable for one penny that the external combustion fuels are considerably cheaper than those suitable for internal combustion. Whether it is more economical to adopt internal or external combustion for road transport depends primarily upon two things—first, the cost of the fuel per gallon or per pound, and, secondly, the mileage per gallon or per pound. For example, a fuel suitable for internal combustion may cost 2s. 4d. per gallon, and transport a 3-ton load seven miles per gallon, which is equivalent to a fuel cost of 4d. per mile, while another fuel suitable for external combustion may cost sixpence per gallon and yield only three miles per gallon, the cost per mile being half that of internal combustion.

The fascination of internal combustion has unfortunately caused the development of the external combustion motor to be neglected and discouraged, notwithstanding the fact that fuels which cannot be immediately combusted internally are relatively cheap and plentiful. Interesting developments are proceeding towards a combination of internal and external combustion, as in the "Still" engine, in Colonel Smith's gas producer, and in other devices designed to secure higher thermal efficiency and the employment of fuels hitherto unsuitable for internal combustion.

The second column of figures against the list of fuels has been obtained by dividing the calorific value of each fuel by its approximate cost in pence per pound, by which we get a comparison of the relative cost of purchasing thermal units in each kind of fuel.

It will be noted that coke is the cheapest form in which to purchase thermal units. This, coupled with the fact that coke is not an imported fuel, but is being produced in increasing quantities as a by-product in the manufacture of gas, makes coke an interesting subject for consideration as a commercial motor fuel. It is, however, not a highly concentrated fuel, and its bulk militates somewhat against its employment on long distance service, unless arrangements are made to pick up supplies at, say, every twenty to thirty miles. The coke should be graded in size so as to pass a 2½-in. and not to pass a ¾ in. ring, and it should preferably be dry. A ton of coke containing 10 per cent. of moisture is actually only 18 cwt. of coke plus 2 cwt. of water. Before the coke can be burnt this water must be evaporated, therefore some of the thermal value of the 18 cwt. of coke has to be expended for this purpose. The net result is that 10 per cent. of moisture reduces to less than 18 cwt. the amount of coke actually available for useful purposes. Dry coke has the further advantage of giving off less fume and making less clinker. A 3-ton lorry can be run 100 miles a day on coke without clinkering until the end of the run.

Trials conducted last year by a Government department with a coke-fired 3-ton lorry recorded a daily fuel cost of 3s. 10d., as against 10s. per day for petrol lorries doing similar duty, a saving of over 60 per cent. in fuel cost, with the added advantage of using a fuel made on the spot.

Pulverised coal is unsuitable for internal combustion, but can be blown into a fire-box and combusted very efficiently. The employment of finely-pulverised fuel has extended enormously during recent years both for metallurgical purposes and for steam raising—for stationary plants as well as for locomotives. This fuel can be made from coal dust and "duff," which has practically the same calorific value, but is several shillings per ton cheaper than large coal. The difference in cost more than pays for the expense of drying and pulverising. This fuel, again, is not in a highly concentrated form (a cubic foot weighs from 30 to 50 lb.), and does not therefore seem suitable for long distance road work until supplies can be arranged for at intervals *en route*.

Electric vehicles, which at first sight appear to be exempt from the fuel problem, are, of course, in reality merely devices for using at second hand the potential energy of relatively cheap fuel which is usually combusted externally to drive a highly efficient steam turbo-generator.

Reference should be made to the investigations of the Inter-Departmental Committees on the employment of gas as a source of power in substitution for petrol and paraffin products, and on matters concerning the production and utilisation of alcohol for power and traction purposes.

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Maintenance.

Maintenance is an item of expense controlled chiefly by five influences, namely—

1. Design of vehicle.
2. Driver's efficiency.
3. Garage organisation.
4. Road conditions.
5. Maximum speed of operation.

Each of these influences might form the subject of a paper.

Design.

It is, perhaps, in design, especially of the chassis and all its details, that the influence of the automobile engineer can be most powerfully exercised towards a reduction of operating expenses. Excellence of design may be judged by the general principle of ability to do the greatest mileage without needing repair. This is sometimes expressed as the "ability to stand the maximum neglect with impunity." I prefer the expression "minimum attention" to "maximum neglect," as attention and neglect are as wide apart as the poles. The correct principle of economical maintenance is to eliminate neglect, and to deal immediately with matters needing attention; to anticipate trouble in its incipient stages, and thus prevent rapid degeneration by the development of graver troubles. The designer's aim should be simplicity and the elimination of all non-essentials. This is true not only of superfluous parts, but also of superfluous material. Reduction in the weight of a vehicle up to a certain point will reduce operating expenses, but should the reduction in weight be carried beyond this point the expense of maintenance would increase as a direct result of the reduced factor of safety.

The automobile designer, when considering the elimination of unnecessary parts, will carefully study the essentials of different types of vehicles, e.g., as between an external and an internal combustion engine. In the former a crankshaft with a single crank can be made to do the work of four cranks operated by internal combustion, with a corresponding saving in cylinders, pistons, connecting rods, valves, bearings, cams, and other gear. Also in the external combustion engine both the magneto and the carburetter can be dispensed with, while the gear-box may have two forward speeds instead of three or four which are desirable with the internal combustion engine. On the other hand, the external combustion engine needs a generator, which the internal combustion engine does not require.

The external combustion engine continues to hold the field in the heavier class of vehicles. It will be interesting to observe how the application of the same principle may be extended to the lighter and swifter class of commercial transport, and so develop the use of cheaper fuels produced in this country, which are unsuitable for internal combustion.

Inseparable from simplicity is accessibility, or the quality of getting at a part in the shortest time, and with the least inconvenience to other parts—designing each part in such a manner that it is least likely to need attention, and arranging that attention can be given in the shortest time.

Drivers.

The care and skill of drivers varies enormously. One man will drive a car 30,000 miles for no greater expense on maintenance than another will incur in one-tenth of the mileage. Lack of judgment in driving, the reckless use of brakes and gears, and neglect to report trouble, are chiefly conducive to the substantial difference in the annual cost of maintaining two vehicles doing similar duty. No satisfactory plan appears yet to have been devised to ensure that drivers shall operate vehicles as carefully as if they owned them and had to pay for repairs.

In view of the fact that the driver influences running costs so seriously, it is extremely desirable that efficient and economical drivers should be specially encouraged. The driver who is reckless of expense is naturally in danger of losing his job, especially when trade union conditions ignore individuality and require that the careless and indifferent man be paid the same rate as the highly efficient one.

Garage Organisation.

A highly skilled but relatively small staff, assisted by cheaper labour, the best labour-saving devices, and proper stores organisation, are most likely to secure that a vehicle shall be in dock for the shortest time possible consistent with proper maintenance, bearing in mind that a vehicle in dock is a double expense, as it is not only not earning money but is a cause of expense for labour and material. The proper maintenance of garage stores is vital. It is bad business to keep a vehicle costing £1,000 out of employment for the want of a part costing £1 or less.

The designer will arrange for the principal units of the chassis to be readily interchangeable in order that, instead of having the whole vehicle out of commission while the unit is being overhauled or repaired, it may be got into earning condition again by the substitution of another unit already in reserve. The defective unit may then be properly overhauled (not under "rush" conditions) with greater certainty of securing satisfactory workmanship. It is probable that the larger garages will be more perfectly equipped and organised, and therefore it may be expected that many traders will be able to contract with a large transport organisation on more favourable terms than by running their own vehicles.

Road Conditions.

A rough and uneven road surface accentuates jar and vibration, not only to all parts of the vehicle and its mechanism (particularly to the unsprung parts), but also to buildings adjacent to the roadway. One of the most effective ways of reducing the cost of vehicle maintenance, as well as injury to adjacent property, is to provide a smooth and even road surface upon a foundation that is adequate to the needs of modern traffic. The provision of such roads is a matter of urgent national importance, necessarily precedent to the proper development of inland transport. Money wisely expended in road improvement will earn a good return.

Speed.

The factor of safety should be considered in relation to the conditions of the particular service, more particularly with reference to the speed of operation and the quality of the road surface. Provided that the maximum speed is strictly limited (as has been done by at least one large undertaking), it has been found that substantial reductions in the cost of maintenance are realised.

The cost of maintenance is closely related to the maximum speed, certainly in not less ratio than the square of the speed, and probably in a greater ratio. When inaugurating a transport service it should therefore be considered *what is the least permissible maximum speed consistent with the essential requirements of the service?* In some services a vehicle is not required to do a big daily mileage, as a large proportion of its time is occupied in loading, unloading, and unavoidable waits. In such cases the maximum speed may with advantage be considerably less than in a long distance express service, and as a result a lighter type of vehicle may be used with satisfaction and economy.

Tires.

Since solid rubber tires are now being used almost exclusively for all classes of commercial vehicles (except the lighter types, which run on pneumatics), it is very interesting to note how the cost of such tires has been gradually reduced in fractions of a penny per mile by improvements in manufacture and by the healthy competition between contractors for tire maintenance upon a mileage basis.

Wherever the daily mileage can be properly recorded (as in a motor omnibus service, where the vehicles operate regularly between definite points), it is preferable not to purchase tires outright, but to contract with the makers for their maintenance upon a mileage basis. In the early omnibus tire contracts, made about fourteen years ago, the sum charged per mile was approximately four times what is now charged for the same service. This remarkable reduction in operating expenses is very creditable to the enterprise of the tire manufacturers, and I am of opinion that we cannot look for much further reduction in the cost of tire maintenance. Even where tires cannot conveniently be operated upon a mileage basis, the general improvement in their manufacture, stimulated by the mileage contracts, secures a corresponding advantage to the ordinary user.

Lubrication.

It does not yet appear to be clearly recognised that the lubricant is an actual part of the constructional material of the engine (or other piece of machinery); in other words, without the lubricant the construction of the engine is incomplete. It follows immediately from this recognition that the same care which is devoted to testing and selecting the solid material of an engine should also be given to the liquid material, with this important difference—that whereas the solid material is not liable to subsequent change in character, except what may be due to "fatigue," the quality of the liquid material may, on the other hand, be seriously depreciated by subsequent neglect of proper vigilance. The chassis builders' specification for the lubricants can generally be relied upon. The difficulty has been to ensure the maintenance of the quality of the lubricants supplied; expecially has this been true of special oils, such as those required to resist high temperatures.

To quote the recent words of an oil expert, "In no other business probably is there the chance to cheat that the oil business offers to the unscrupulous." There are always to be found those travellers in lubricating oils who will profess their readiness to supply an oil "just as good" at a lower price. In buying lubricating oil, price

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is a secondary consideration; character in the supplier is all-important.

The motto for lubrication should be, "Use the best quality in the smallest possible quantity." Any supply of lubricant in excess of the necessary requirements is wasteful and expensive. Lubricant can be wasted from a vehicle by over-feeding, by running at too high a level, or by a defective construction of the container so as to permit leakage. Loss of lubricant may occur in the garage by bad arrangements for storage, and by the use of open vessels to transfer it to the vehicles, which is both wasteful and dirty.

Too much care cannot be taken to keep lubricating oil clean, and to properly measure and record the amount supplied to each vehicle. There is no more certain and rapid way of wearing out the vitals of a machine than by introducing dirt with the lubricant into the bearings. Careful attention to this point will be well repaid by reduced cost of maintenance.

Accidents.

Accidents represent another item of transport expense which may be reduced to still smaller dimensions. Accidents are not only a cause of expense, but also of suffering, and therefore for humanitarian as well as for financial reasons every care should be taken to prevent injury to persons and property.

The steps which are being taken by the "Safety First" organisation to inculcate rules and habits of safety in children and pedestrians, and the encouragement to drivers of all classes of vehicles to give greater consideration to the avoidance of accidents, cannot fail to have beneficial results.

There is a cause of personal injury which is still permitted to remain. I refer to the rule of the footpath, "Keep to the right," which would be quite correct for safety provided that the rule of the road were also "Keep to the right." As the rule of the road is "Keep to the left," this should also be the rule for the footpath, in order that pedestrians walking nearest to the kerb shall face the road traffic nearest to them. Fifty-four Metropolitan and extra-Metropolitan local authorities, and 24 tramway authorities, have expressed approval of the proposed alteration of the custom of keeping to the right of the footpath. Unfortunately little material progress has been made with the police authorities.

Depreciation.

Consideration of the depreciation of commercial vehicles introduces us to the vexed question as to what is the proper percentage of the first cost to write off annually. It has been the practice with some transport owners to write off the whole cost in five years; on the other hand, there are vehicles which, after ten years' service, are regularly doing over 100 miles a day. With proper maintenance and upkeep, a vehicle may operate after ten years as efficiently as when first put on the road.

Depreciation should be regarded more as pertaining to the type of vehicle the efficiency of which is limited by its design. It should always be remembered that the first cost of a vehicle is of secondary importance to its cost of operation. It may be that £200 expended to secure a superior type of vehicle may result in an annual saving of possibly half this sum in cost of operation.

The above analysis of operating expenses of a transport organisation will, it is hoped, serve to indicate possibilities of future reductions being achieved. On the automobile engineer rests chiefly the responsibility for developing transport. By his effort will national circulation be quickened and invigorated in every part, and stagnation be made to disappear.

ELECTRIC VEHICLE PROGRESS.

Glasgow Electricity Committee recommend acceptance of tenders as follows:—Orwell Electrics for one 3½-ton vehicle at £1,200; General Vehicle Company for one 2-ton vehicle at £910; Messrs. R. Garrett and Company for one 2-ton vehicle at £950; and Edison Accumulators, Limited, for one 2-ton vehicle at £1,120, one 3½-ton vehicle at £1,470, and one tractor at £1,448.

Barnes Urban Council, as the cost of removing clinker from the dust destructor by horse and cart is so expensive, have decided to get an electrically propelled tractor at a cost of £430.

South Shields Corporation are making inquiries as to electric vehicles, and have authorised the borough engineer to purchase a vehicle if obtainable at an advantageous price.

Hackney Borough Council have been recommended by their Works Committee to accept the offer of Messrs. Ransomes, Sims and Jefferies, Limited, to supply two 2-ton and two 3½-ton electric vehicles for the sum of £5,118. Tenders were received from four other firms, two of whom quoted lower figures.

MANCHESTER CORPORATION OMNIBUSES.

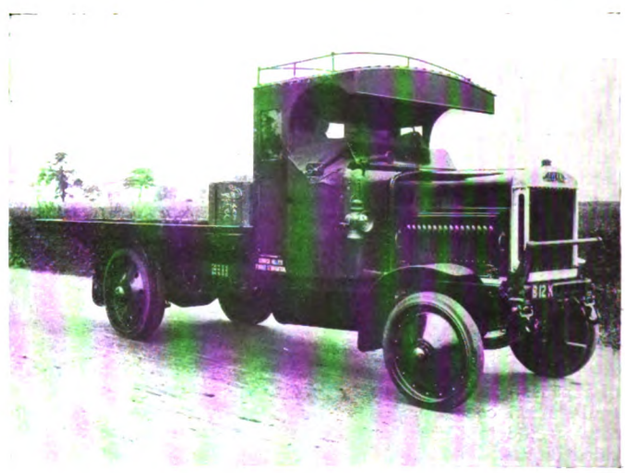
During the year ended March 31, 1919, the motor omnibuses of the Manchester Corporation Tramways department ran 218,292 miles, and carried 1,821,310 passengers. On a traffic revenue of £13,568, the receipts per mile were 11·637d., as against 9·564d. in 1917-18, while the working expenses were 14·918d. per mile, as compared with 13·424d. for the previous year. The details of the expenditure are appended—

	1918-19 per mile d.	1917-18 per mile d.
Superintendence and other traffic wages	·200	·200
Wages of drivers and guards	2·507	2·631
Bonuses and sick pay	·040	·039
Cleaning and oiling	·719	·599
Depot expenses	·192	·163
Ticket check	·285	·246
Uniforms	·113	·134
Licences and sundries	·065	·052
Salaries and wages—administration ...	·138	·140
Rates on depots	·088	·089
Printing and stationery	·023	·020
Fuel, light, and water	·022	·018
Compensation	·055	·055
Insurances	·044	·044
Tires	·530	·406
Chassis	1·500	1·032
Bodies	·255	·284
Buildings and machinery	·060	·060
Petrol	4·801	3·352
War bonuses	1·674	·745
Depreciation	1·376	1·385
Balance carried to tramways account ...	·231	1·730
Total	14·918	13·424

In the Parliamentary Bill to be promoted next session the estimates include 20 omnibuses at £1,750 each, garages and works extensions £50,000, petrol and other mechanical vehicles £20,000.

LEYLAND 4-TON LORRY.

The manufactures of Leyland Motors (1914), Limited, of Leyland, Lancashire, are now being widely purchased for commercial use. The G type 4-ton lorry illustrated below, replete with improvements in the chassis and body resulting from war experience, was supplied to Mr. G. Hill, of Duke Street, Brighton. The platform



Leyland Vehicle that can be Fitted with Side Rails.

body is fitted with removable side rails, this arrangement being specially contrived to facilitate the loading and unloading of heavy loads. The picture shows the platform minus the side rail.

Cost of the Strike to the Taxpayers.—It was stated in the House of Commons on October 27 that the expenditure entailed on the Ministries of Transport and Food by the strike amounted to £3,500,000.

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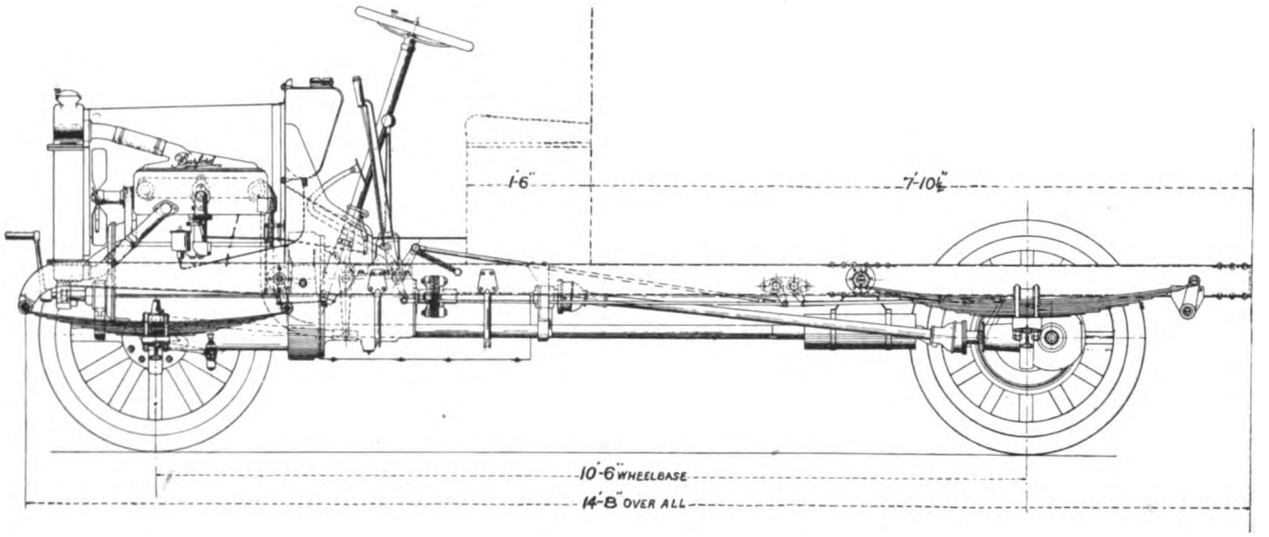
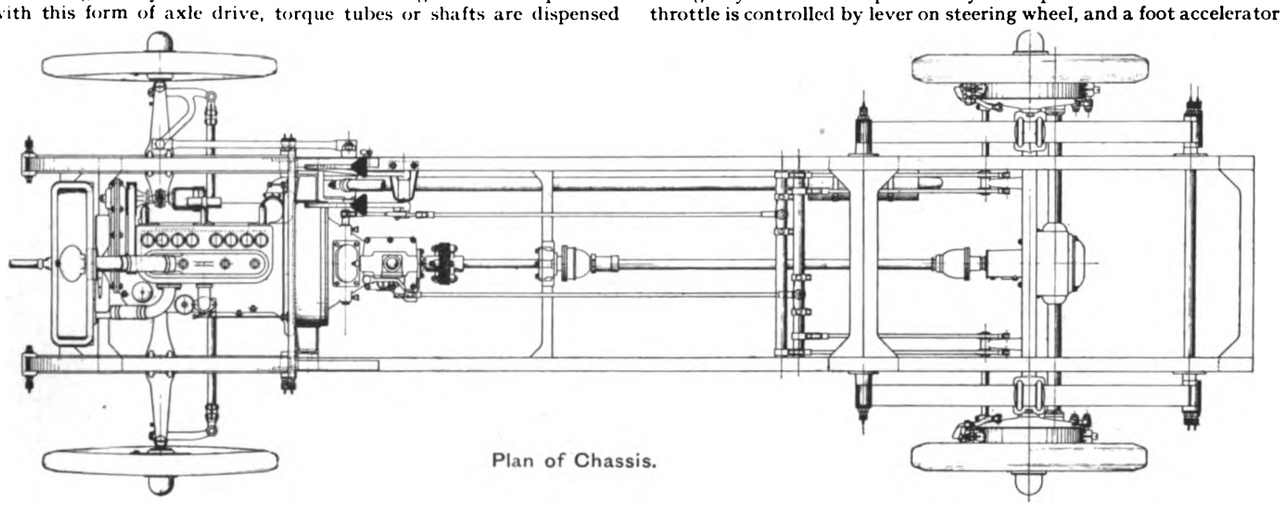
THE NEW BURFORD ONE-TON MODEL.

The new 1-ton commercial chassis which H. G. Burford and Company, Limited, of 16, Regent Street, London, S.W., are placing upon the market, should be welcomed with considerable interest by the very large class of users of light and speedy commercial vehicles. In designing this new chassis, Mr. Burford has relied upon his experiences of the known results of the running of his popular 2-ton model. In all its important features it is a duplicate of the 2-ton chassis, merely being of lighter construction.



Side Elevation of Chassis of Burford One-Ton Model.

For 22 years Mr. Burford has been a consistent adherent of the internal gear drive for the final transmission, and maintains that, from the engineering standpoint, to transmit the power as near as possible to the periphery of the road wheels must be the ideal form of drive. By using the Burford axle this is achieved, and as it embodies lighter construction, higher efficiency is also obtained. Interchangeability is also a feature of the design. From experience with this form of axle drive, torque tubes or shafts are dispensed with, provision being made for their absence by the ample size of the front carrier for the rear springs.



Plan of Chassis.

It will be noted from the drawings here produced that simplicity is the keynote of the construction. The number of working parts are reduced to the minimum, ample loading space is provided, while evidence of the careful study the springing of the chassis has received is afforded by the length of the springs. The springs are of high-grade alloy steel of ample width, with a considerable number of plates of medium thickness. The bonnet, tank, and foot plates are all of pressed steel, standardised for production purposes. The chassis is designed to carry a load of one ton (additional to the weight of an ordinary lorry body).

The following is a brief specification :—

Four-cylinder engine, with 3½ in. bore × 5⅛ in. stroke developing 23 H.P. at 1,000 revolutions per minute. Dimensions of main crank-shaft bearings :—Front 1¾ in. × 2⅞ in., centre 2 in. × 2¼ in., rear 2⅛ in. × 3¼ in., connecting rod bearings 1⅞ in. diameter × 2 in. long.

The power plant is of the unit construction, comprising motor, clutch, and gear box. Three-point suspension to chassis. Automatic carburetter of the float feed type. High tension magneto ignition, with fixed spark.

The cooling is on the thermo-syphon system, large water pipes and passages being provided. The radiator of the gilled tube type is constructed with demountable head and bottom tank, and a belt driven cooling fan is fitted. The petrol tank is of steel plate, secured behind the dash, and having a capacity of 8 gallons. The clutch is of the multiple disc type, working dry and enclosed in housing. The levers for gear change and service brake are arranged at the centre, the steering gear on right-hand side. The clutch and emergency brake are operated by foot pedals. The carburetter throttle is controlled by lever on steering wheel, and a foot accelerator pedal is also fitted. Three speeds forward and one reverse are provided; all gear wheels are of special heat treated steel, the gear shafts being mounted in ball bearings.

The frame is constructed of pressed steel, 4½ in. × 2 in. × $\frac{3}{16}$ in. The side members are in nickel steel. The frame is straight, well stayed, with gusseted cross members.

The front axle consists of a steel drop forged I section with spring seats integral. The stub axle arms are 1½ in. diameter.

The rear axle is of special design and consists of a dual unit, one taking the load and another the drive. The axle bearing the load is of solid drop forged steel of I section, and spring seats being integral with same. The gear reduction from cardan shaft is obtained by bevel wheels and internal gear rings and pinions to each

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road wheel, providing a total gear reduction of 7 to 1. The differential is of the bevel wheel and pinion type. It is claimed that this form of drive is 25 per cent. more efficient than any other and 30 per cent. lighter.

The drive and torque is taken through rear springs, which are specially designed to carry them. The front springs are 38 in. long × 2½ in. wide, with eight leaves. The eyes are bushed with gun metal. The rear springs are 48 in. long × 3 in. wide, with ten leaves, the eyes being also bushed with gun metal.

All four wheels are 34 in. diameter. The front wheels are fitted with 3 in. tires and rear wheels with 4 in. tires of the solid rubber band type. The front and rear wheels run on the axle arms on roller bearings. Two sets of brakes are provided, operating on drums on the rear wheels, and comprise external band brakes operated by foot pedal and internal expanding brakes operated by hand lever. The diameter of brake drums is 15 in. and width of brake shoes 2½ in.

The wheel base is 10 ft. 6 in., while the wheel track, both front and rear, is 4 ft. 8 in. The chassis dimensions are :—Length overall, 14 ft. 8 in. ; length behind driver's seat, 8 ft. ; centre of back axle to end of frame, 2 ft. 7 in. ; width of frame outside, 2 ft. 7 in.

TOWN PLANNING AND TRANSPORT.—In an address on October 24 to the Town Planning Institute, Mr. G. L. Pepler, the president, referring to the Ministry of Transport, stated that the bringing of all terrestrial traffic services, including the establishment of new ones, under the direction of one Minister should greatly simplify planning ahead and providing wisely and economically for traffic services, which was such an important part of the town planner's work. Possibly some of them already had an eye on Section 17 of the Act, which gave the Minister power to make advances for certain purposes, including the construction, improvement, and maintenance of roads, bridges, and ferries, because they felt that, coupled with town planning schemes, the Minister could make a little money go a long way in the direction of improving communications.

STRAKER-SQUIRE STREET WASHER.

The illustration on this page shows one of the street washing machines which Straker-Squire, Limited, of Edmonton, have recently delivered to the borough of St. Marylebone. It is claimed for this machine that great economy can be obtained by its use, both as regards the amount of work done per day and in the cost of the maintenance when compared with brush fitted plant. A machine of this type will be exhibited at the Road and Transport Exhibition.

THORNYCROFT VAN.

The well-known firm of John I. Thornycroft and Company, London, are now fully engaged in placing their five years of war vehicle experience at the service of commercial users. Thornycroft

A Van by John I. Thornycroft and Company.

machines from 30 cwt. upwards answered all demands on various war fronts. In the illustration of a van supplied to a Kingston-on-Thames firm, an improvement in the strength of wheels is shown.

AN OMNIBUS LIFEGUARD PATENT UPHELD.

The Court of Appeal have allowed the appeal from a judgment of Mr. Justice Sargent in an action, Bonnard and others *v.* the London General Omnibus Company. It was alleged that the company had infringed a patent device for preventing people falling beneath the rear wheels of a motor vehicle, but the defendants denied the allegation, and objected to the patent on the ground of want of novelty, want of subject matter, and want of utility. The Court of Appeal unanimously allowed the appeal, and ordered an inquiry as to damages.

Straker-Squire Street Washing Machine.

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MOTOR TRAFFIC NOTES.

OXFORD-BANBURY OMNIBUS SERVICE.—On October 30 a motor omnibus service was begun connecting Oxford, Stratford-on-Avon, Leamington, Warwick, and Banbury.

ROTHERHAM AWAITING OMNIBUSES.—The Corporation Tramways department are awaiting delivery of several omnibuses in order to provide means of communication for the Silverwood district.

SEVEN TILLING-STEVENS OMNIBUSES FOR WOLVERHAMPTON.—The Corporation Tramways department have ordered seven motor omnibuses with Tilling-Stevens chassis at a cost of £12,000.

COUNCIL PREFERS AN OMNIBUS SERVICE.—Willesden Council have decided to oppose the London County Council scheme for a tramway between the Marble Arch and Cricklewood, on the ground that an omnibus service is more efficient.

GOVERNMENT CARS IN USE.—In the House of Commons on October 23, Mr. Bonar Law stated that the number of cars in use in connection with the Government departments was as follows:—In London, 72; in the country, 330.

OMNIBUSES FOR SOUTHEND.—Motor omnibuses are to be run in connection with the Southend Tramways, and the Corporation are considering the desirability of seeking powers to run the vehicles to places outside the borough boundaries.

CHARGE FOR CORPORATION OMNIBUS MILEAGE.—North Riding County Council, on October 29, assented to the motor omnibuses of Stockton Corporation running over the North Riding portion of Yarm Bridge on payment of 1¼d. per mile run.

OMNIBUS SCHEME FOR HEREFORDSHIRE.—An application by the Birmingham and Midland Omnibus Company for permission to run their vehicles on various routes in Herefordshire has been referred to a committee of the County Council.

DENNIS BROTHERS' EXPORT BRANCH.—The export branch of Dennis Brothers, Limited, of Guildford, is experiencing great activity, and Colonel Hellawell, late of the Aldershot Traction Company, Limited, has been appointed manager of the department.

VALUE OF STREET REFUGES.—At an inquest held by the Westminster coroner on the body of Mr. Gilston, an ex-Lord Mayor of Leeds, who was knocked down by an ombinus in Parliament Square, the coroner said it was obvious that a refuge was necessary at the place where the accident occurred.

OMNIBUSES PROPOSED FOR LINCOLN.—In order to provide for the needs of those parts of the city not served by tramways, the Tramways Committee are preparing a proposal for running motor omnibuses. The surface contact tramways are being converted into the overhead wire system.

MOTOR SERVICE INSTEAD OF TRAMWAY EXTENSIONS.—The street railway company at Waynesboro, Pa., having refused to provide loop lines on account of the many railway crossings in the district, a jitney motor service is being planned in connection with the extensive house building movement now in progress.

OMNIBUSES IN PLACE OF TRAMWAYS.—By permission of the New York City Public Service Commission, sixty motor omnibuses have been placed in operation on four cross town street railway lines which have ceased to be worked. The routes served are Spring Street, Delaney Street, Maddison Street, Chambers Street, Avenue C, and Third Avenue.

MOTOR VEHICLES FOR BREAKDOWN GANGS. The Local Government Board have sanctioned an application by the London County Council to the period of five years proposed for the repayment of expenditure of £5,500 on capital account in respect of six additional motor vehicles for use in connection with the breakdown of traffic on the tramways.

MUD-SPLASHING AT GLASGOW.—No action is to be taken by the Magistrates' Committee of Glasgow Corporation regarding a suggestion to obtain powers compelling provision of mudguards of sufficient width to prevent pedestrians being splashed with mud by motor cars. Probably the justices recognised that the fault rests with the uneven nature of the road surface caused by the need of repairs.

GLASGOW CORPORATION GARAGE.—Having made inquiries with a view to increasing the efficiency of the central garage, a special committee of the Glasgow Corporation make the following proposals:—To sell five old cars; to do without cleaners, and instruct drivers to clean their own cars; to purchase additional tools to facilitate repair work; to reduce night work; and to do all night work with the oldest cars in the garage.

THE KING'S MEMENTO TO CHAUFFEURS.—King George V. greatly appreciated the services of the drivers who drove his cars from Balmoral to London during the railway strike. On October 9 His Majesty received and thanked them, and gave each a memento of the long and interesting trip. To Humphrey, his senior driver, the King gave the medal of the Royal Victorian Order, and a tie-pin in the form of a crown in brilliants.

MOTOR VEHICLES FOR MUNICIPALITIES.

CLITHEROE COUNCIL have agreed to purchase an ambulance.

SEVENOAKS COUNCIL have ordered a steam wagon and trailers.

BATLEY COUNCIL have received tenders for the supply of a motor fire engine.

ACCRINGTON COUNCIL are obtaining a motor vehicle for scavenging purposes.

WREXHAM RURAL COUNCIL have decided to purchase an ambulance at a cost of £320.

PRESTON CORPORATION have decided to purchase a Leyland lorry at a cost of £1,290.

WEDNESFIELD URBAN COUNCIL have arranged to purchase a steam wagon at £700.

NORWICH URBAN COUNCIL have decided to purchase a petrol wagon at a cost of £1,061.

LINCOLN TRAMWAYS COMMITTEE have decided to get two vehicles for the removal of refuse.

WIGAN COUNCIL have decided on the purchase of three tipping wagons at a cost of £3,580.

MERTON AND MORDEN URBAN COUNCIL have decided to purchase two electric vehicles at £2,750.

HINDLEY URBAN COUNCIL have decided to purchase two motor tipping wagons at a cost of £735.

BRISTOL CORPORATION are seeking sanction for a loan of £6,600 for the purchase of six tipping wagons.

SYDNEY (N.S.W.) COUNCIL have agreed to purchase a Buick car for the surveyor's department, at a cost of £485.

BURNLEY CORPORATION are purchasing a tipping wagon in order to lower the expenditure entailed by hired team labour.

SHEFFIELD CORPORATION are considering a proposal to spend £50,000 on electric vehicles for the collection of house refuse.

LLANELLY CORPORATION have received authority to borrow £5,700 for the purchase of electric vehicles for street cleansing.

GOSFORTH URBAN COUNCIL are getting a loan of £2,520 for the purchase of two motor vehicles for the collection of house refuse.

BURTON-ON-TRENT CORPORATION have received permission to purchase a motor fire engine and to repay the loan in a period of ten years.

HETTON URBAN COUNCIL have applied for sanction to borrow £6,000 for the purchase of electric vehicles and the erection of a garage.

HACKNEY COUNCIL have been advised by a committee to purchase four battery vehicles from Messrs. Ransome, Sims, and Jeffries, Limited, at £5,118.

BRADFORD ELECTRICITY COMMITTEE have authorised the deputy chairman and the engineer to arrange for the purchase of two 10-cwt. delivery vans.

WOLVERHAMPTON CORPORATION have asked Messrs. Ransome, Sims, and Jefferies to fit an electric tipping gear, at a cost of £50, to their 3½-ton electric vehicle.

THE MINISTRY OF HEALTH have held an inquiry respecting a scheme for the provision by Whitehaven Council of a motor fire engine and new station at a cost of £3,246.

HARWICH COUNCIL are purchasing two 2½-ton electric vehicles for street scavenging. At the lowest estimate it is expected that the abolition of horses will give a saving of £178 a year.

WALTHAMSTOW URBAN COUNCIL have purchased a motor cycle and side car at a cost of £129 for the road foreman, and four second-hand Clayton steam wagons from the Government at £2,130.

BOLTON ELECTRICITY COMMITTEE have asked the chairman, vice-chairman, and electrical engineer to take into consideration the question of obtaining a transport vehicle for use in the electricity department.

SOUTHEND COUNCIL propose to accept the tender of Messrs. Dennis Brothers, Limited, amounting to £1,490 for a 65-B.H.P. 400/500-gallon turbine motor fire engine and ladder carrier and £95 for a first aid tank outfit.

OLD GOVERNMENT LORRIES.—In consequence of the protests of local authority about the damage to the Hounslow roads by the haulage of worn-out lorries on the way to Slough, the War Office have arranged that no more such vehicles shall pass through the district.

GLASGOW ELECTRICITY COMMITTEE have recommended acceptance of the following tenders for the supply of electric vehicles:—Orwell Electrics, for one 3½-ton vehicle, at £1,200. General Vehicle Company, for one 2-ton vehicle, at £910. Messrs. R. Garrett and Company, for one 2-ton vehicle, at £1,120. Edison Accumulators, Limited, for one 2-ton vehicle, at £1,120; one 3½-ton vehicle, at £1,470; and one tractor, at £1,448.

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MOTOR TRAFFIC

ROADS AND TRANSPORT EXHIBITION.

The Roads and Transport Exhibition which is being held in conjunction with the Congress at the Agricultural Hall, Islington, from November 20 to 27, should prove to be an undoubted success, as it is meeting with the support of the majority of the leading men in this all-important industry.

The Congress and Exhibition has been organised under the auspices of the County Councils Association, with the active co-operation of the associations representing the engineers and surveyors of the municipal, urban, and rural councils.

In view of the vital importance of the subjects to be discussed, it is highly important that all who are interested in the use or construction of roads should attend the congress. The papers to be submitted cover a wide field; they embrace practically all forms of road construction and deal with a number of traction problems the solution of which should prove most helpful to road users.

The exhibition is of a most comprehensive character. All the available space has been allotted, and a thoroughly representative range of exhibits will be staged by the leading manufacturers of road material and transport vehicles. The industrial motor vehicles will include the latest examples of steam wagons, petrol vehicles of various types, petrol-electric machines, and electric battery vehicles. Many of these will be fitted with bodies specially designed for particular municipal service, such as street washing, gulley clearing, street sweeping, etc., while a variety of tipping bodies will also be on view. Several new models will be seen for the first time, but the majority of the exhibitors will rely upon the well-proved chassis which has become their standard, and has won the confidence of the users, merely making small modifications and improvements which are the outcome of the experience gained in watching the performance of their machines during their strenuous service for the War Office.

The following is a brief description of some of the exhibits—

Leyland Motors, Limited, Leyland, Lancs., exhibit three vehicles—a 4-ton petrol chassis fitted with a screw operated tipping body, a new type of steam vacuum gulley cleaner, and a fully equipped Leyland 500 gallon motor fire-engine.

Guy Motor, Limited, Wolverhampton, are showing a 2-ton chassis fitted with a tipping body operated by a twin screw.

Tilling-Stevens, Limited, Maidstone, are staging two vehicles—a petrol-electric fire tender complete with escape, and a 2½-ton chassis fitted with a hand operated tipping wagon body.

Straker-Squire, Limited, Angel Road, Edmonton, have included three municipal vehicles, each of special interest, viz., a vacuum gulley wagon for extracting mud and refuse from street gulleys, with a capacity for 3½ tons, a 1,100 gallon street watering machine, fitted with high pressure water jets and an arrangement of squeegees for street washing, and a 5-ton tipping wagon (Constable's patent).

General Vehicle Company, Limited.—The exhibit on this stand is a 3½-ton G.V. electric vehicle equipped with a Craymer patent unloader.

Clayton and Company (Huddersfield), Limited.—At this stand will be shown an interesting machine which is described as a combined road sweeper and collector, fitted with water sprinkler. The chassis is the "Karrier" 35 h.p. motor.

The Lacre Motor Car Company, Limited, exhibit two vehicles of special interest for municipal service—a type "L" Lacre road sweeper and a combined lorry tipping wagon and water-cart.

Dennis Brothers, Guildford, stage no less than four separate exhibits—a street water-tank fitted with the Warwick sprinkler gear, an end tipping wagon of 3-4 tons capacity, a tower wagon extending to a height of 19 feet, and a Dennis motor turbine fire-engine with a capacity of 450 gallons per minute.

Richard Garrett and Sons, Limited, Leiston, Suffolk, show two machines, a "Garrett" No. 5 superheated steam wagon fitted with a mechanically operated tipping body, and a "Garrett" 3½-ton patent electric vehicle fitted with electrically operated tipping body.

J. and E. Hall, Limited, of Dartford, will have two municipal vehicles on show—a 5-ton tipping wagon and a 5-ton water-cart.

The Maudslay Motor Company, Limited, Parkside, Coventry.—The two exhibits on this stand are both end-tipping wagons, one for 4-ton loads, divided into four compartments, and a 5-ton machine.

The Albion Motor Car Company, of Scotstoun, Glasgow, will be showing a 3½-ton 32 h.p. chassis fitted with a tipping body operated by hydraulic gear.

The Associated Equipment Company, Limited, of Walthamstow, exhibit one of their standard 4-ton chassis fitted with a metal tipping body.

The Daimler Company, Limited, Coventry, are staging a 2-3 ton chassis fitted with a 40 h.p. sleeve valve engine; this is also fitted with an all steel tipping body with hydraulic gear.

Foden's, Limited, Sandbach, Cheshire, show a specimen of their latest model 5-ton steam wagon fitted with rubber tires.

H. G. Burford and Company, Regent Street, London.—The two exhibits on this stand consist of a 29-h.p. "Burford" chassis designed to carry a useful load of two tons, and the "Stamper" loading truck. The latter has a detachable body mounted on a skeleton frame. In use it is found to be a considerable time and labour saver.

Ransomes, Sims and Jefferies, Limited, Orwell Works Ipswich, are showing an example of the Orwell electric vehicle fitted with a tipping body having a capacity of 7 cubic yards.

John I. Thornycroft and Company, Limited, will exhibit one of the ten 40 h.p. "J" type tipping wagons which they are supplying to the Westminster Council.

Caledon Motors, Limited, Glasgow.—Four-ton chain-driven chassis.

British Four Wheel Drive Tractor Company.—A four-wheel driven machine capable of carrying a load of three tons and haul a trailer carrying five tons.

W. and G. Du Cross, Limited, Acton, show a "W. and G." 2-ton tipping wagon.

Walker Brothers (Wigan), Limited, show three vehicles, designed for three, four, and five ton loads, each being fitted with tipping bodies.

Tuke and Bell, Limited, Lichfield, show a tipping wagon trailer.

Yorkshire Commercial Motors Company, Leeds, show a rubber-tired steam wagon.

W. Tasker and Sons, Limited.—The two exhibits on this stand consist of a 5-ton steam tractor with an end tipping trailer.

Robey and Company, Limited, Lincoln, exhibit a 5-ton steam tipping wagon.

The Eagle Engineering Company, Limited, of Warwick, have a number of exhibits, including a 5-ton trailer arranged to tip either side.

John Fowler and Company, Leeds, show one of their "Tiger" tractors.

The Dunlop Rubber Company, Para Mills, Birmingham, show a wide variety of their solid band tires, together with a number of worn tires with remarkable mileage records.

Chas. Macintosh and Company, Limited, Cambridge Street, Manchester.—This exhibit will include a range of Macintosh solid rubber tires, and in addition a range of wheels, each being suitable for road traction of every description.

The Shrewsbury S. T. and Challiner Tire Company, Limited, Ardwick Green, Manchester, stage a comprehensive range of wheels and tires of all sizes.

The North British Rubber Company, Limited, show examples of the "Clincher" tires for all classes of heavy and light road transport.

The Herbert Frood Company, Limited, the manufacturers of "Ferodo" patent brake and clutch linings, exhibit samples of this material suitable for all classes of machinery, as well as for stair treads, friction wheel drives, and other purposes.

Pinchen, Johnson and Company, Limited, Bevis Marks, London, have a striking exhibit designed to give effect to the excellent results obtained by the use of the high-class paints and enamels manufactured by this firm.

The British Reinforced Concrete Engineering Company, Manchester.—This company show a sample of road slab reinforced with No. 9 B.R.C. fabric, together with a number of photographs of reinforced roadwork.

Hadfields, Limited, Sheffield, show a number of machines manufactured by the company for the production of road metal. The "Hecla" disc crusher will be shown in motion.

John Yates and Company, Limited, Aston Manor, Birmingham, are showing a complete collection of tools and appliances required for the construction and upkeep of roads, tramways, and railways. It is worthy of note that this firm has made a speciality of road construction tools since 1804.

The December issue of The Tramway and Railway World will include an illustrated description of the exhibits.

Left-hand Steering.—Interviewed on the announcement that Ford cars for the British market are to follow the practice of left-hand control prevalent in the U.S.A., an official at Scotland Yard has stated that the idea does not find favour with the police. "There would not be," the official stated, "so much difficulty in giving the recognised traffic signals in an open car with left-hand steering, but with a closed car, or with the hood up, it would be impossible." The American system, we may add, is not wholly in favour among Americans. To understand that assertion one had only to talk to U.S.A. soldiers who were driving right-hand controlled cars in this country during the war.

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THE
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SATURDAY, NOVEMBER 15, 1919

PROBLEM OF UNPROFITABLE OMNIBUSES.

Many singular proposals have come from Labour since the close of the war, but none have been quite so extraordinary as that which the vehicle workers' trade union brought before the London Liberal members of the House of Commons on Monday last. A deputation informed the legislators that the impending withdrawal of 150 omnibuses of the National Steam Car Co. will throw one thousand men out of employment, and invited their "assistance to secure the retention of the omnibuses." As an additional incentive the deputation urged that withdrawal of the vehicles will accentuate overcrowding. The report of the proceedings gave no indication of the manner in which it is proposed to keep the omnibuses in operation, but an official of the union stated that it was " hoped that the Minister of Transport might be able to intervene." As was to be expected, no intervention can be looked for from that quarter, for in reply to a question put to him in the House on Wednesday, Sir R. Williams, Parliamentary Secretary to the Ministry, stated that the company is a private undertaking, and the Ministry has no power to insist that privately-owned vehicles should continue to run. The reason of the withdrawal, as was stated in our issue of last week, is that the vehicles are being run at a considerable loss. Doubtless the members who were approached replied to the deputation in terms similar to the official answer given in the House, for they must be aware that omnibuses are exempted from the Ministry's sphere of operations. Probably the union based their hopes upon the fact that early in the year, when complaints were made that there were an insufficient number of public vehicles running, the Government placed 143 army lorries at the service of the London General Omnibus Co. The terms of the transaction have not been disclosed, but as these machines are being run at a loss of 5d. per mile, or £1,700 a week, it is evident that the company cannot be left to bear the loss. If the union based their hope of Government intervention upon this circumstance, there is need to point out that rapid progress is being made both by the Omnibus Co. and by the County Council tramways department in placing additional vehicles in service, and that both organisations have expressed their intention of doing everything possible to make good the deficiency caused by the withdrawal of the steam omnibuses. The L.G.O.C. have already taken over some of the garages, and no doubt they will be able to find employment for a considerable number of the displaced employees. Above all, the union should remember that one of the chief reasons for the withdrawal of the roomy and comfortable steam cars to the provinces is to be found in their demands for increased wages, to meet which fares have to be advanced on all surface and underground transport systems in London. It is not unlikely that at the end of their respective financial years several provincial authorities, both municipal and company, will find themselves in difficulties. If the Steam Car Co. incident leads employees to understand that they "cannot have their cake and eat it," they will have learnt a useful lesson in economics.

INCREASES IN FARES.

Paisley District Tramways Company have been authorised by the Ministry of Transport to alter their charges under the Statutory Undertakings (Temporary Increase of Charges) Act, 1918, and the halfpenny fare was abolished on November 6. No other alteration has been made so far as workers' fares are concerned. Children will be charged half the ordinary fare with a minimum of 1d. The charge for three stages, formerly 1½d., is now 2d ; five stages, formerly 2½d., is now 3d., seven stages, formerly 3d., will now cost 4d., and eight stages, formerly 3½d., will now also cost 4d. For longer distances no change has been made in the fare.

Birmingham and Midland Tramways Company have informed the Oldbury Council that it is their intention to revise the scale of fares on the tramways throughout the Black Country. A minimum ordinary fare of 1½d. will be instituted. Workmen's fares for the most part will remain unaltered.

Hull City tramway fares were again discussed by the City Council on November 10, when the recommendation of the Tramways Committee that the fare for any stage up to 9 a.m. should be raised from a halfpenny to a penny was approved. The fare for the through routes is to be 3d. for the whole distance, with overlapping stages at 1d., 1½d., 2d., and 2½d. on the principle at present in force. Fares for school children will be ½d. for the same distance as at present. Wounded soldiers and the blind are to be carried free. The Sheriff stated that the reason the fare was raised from ½d. to a 1d. was that all classes of passengers should equitably bear the increase. There was no attempt to make the working classes pay more than their due proportion. On the through services of cars the Committee had been able to fix children's fares at one-third instead of one-half, so that those who had large families should obtain the benefit of the tramway service and not be overburdened with the charge.

The Aberdare Council will on Monday, November 17, raise the 1d. fare to 1½d. They will also discontinue the issue of discount tickets.

The Quebec Public Utilities Commission has ratified the 7 cent (3½d.) fare granted by the Montreal Tramways Commission to the Montreal Tramways Company.

A number of street railway companies in the United States are finding it impracticable to continue the 5 cent universal fare, and increases are being made in many towns. The State Public Service Commission of Maryland has authorised the United Railways and Electric Company of Baltimore to charge a 7 cent (3½d.) fare. The Capital Traction Company, Washington, and the Washington-Virginia Railway Company also instituted the 7 cent fare on November 1.

ROADS AND TRANSPORT CONGRESS AND TRANSPORT.

A Roads and Transport Congress and Exhibition, promoted by the County Councils Association, will be held at the Royal Agricultural Hall, London, N., from November 20 to 27. Sir Eric Geddes, Minister of Transport, will perform the opening ceremony on Thursday next. A large number of firms will be represented, and the whole space in the Agricultural Hall has been taken. In the galleries an interesting exhibition devoted to public works has been arranged. Many exhibitors will show industrial motor vehicles, including examples of steam, petrol, petrol-electric and electric accumulator vehicles. Some of these will be fitted with bodies designed for various municipal services, and several models will be shown for the first time.

The exhibition will be attended by a large number of delegates from Corporations and local authorities. The Ministry of Health has given special sanction for the payment of expenses for two delegates from each local authority, and has expressed the view that one delegate should be the surveyor or other officer. The exhibition will be closed each evening at 7 p.m.

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L.C.C. TRAMWAY MATTERS.

At the meeting on Tuesday no important tramway business was dealt with, but the Highways Committee, brought up reports on several minor matters.

GREENWICH POWER STATION.—Certain alterations have been found desirable in the arrangement of the coal bunkers at Greenwich power station. At present the longitudinal division in the bunkers is not carried up to the full height. This was not important while one class of fuel was in use, but now that coke and coal breeze is also used the capacity of the coal bunker is considerably reduced by the necessity of keeping the different kinds of fuel separate. It is therefore proposed to heighten the division of the bunkers and to arrange for the completion of the coal shoots at the southern end. The Highways Committee reported that the cost of the work is estimated not to exceed £3,000. The increased storage accommodation is urgently required and it was agreed that tenders for the work should be invited from selected firms.

RAIL GRINDING MACHINES.—A rail grinding machine purchased some months ago has since been continuously employed and it is regarded as an excellent investment. The Highways Committee now recommend that a second grinding machine should be obtained at a cost of about £675.

PAY OF NIGHT INSPECTORS. The rate of pay of assistant night inspectors was fixed in October, 1914, at 40s. a week, rising by annual increases of 1s. to 45s. a week, and of acting assistant night inspectors at 39s., rising after a probationary period of six months to 40s. a week. In view of the fact that this grade of employees is recruited from the ranks of conductors, whose pay is 6s. 6d. a day (pre-war conditions), and that their duties are of a more responsible nature, it was proposed that their rate of pay should be increased. The expenditure involved in increasing their rate of pay to 42s. a week, rising by annual increases of 1s. to 45s., and of acting assistant night inspectors to 7s. a day, was agreed to. The annual holidays of night inspectors were increased to 12 days and district traffic inspectors were also granted 12 days' holiday annually.

ROADS AND TRANSPORT CONGRESS.—At the request of the County Councils Association, and on the recommendation of the Highways Committee, their chairman, Mr. W. J. Squires and Mr. A. L. C. Fell, tramways general manager, were appointed delegates to attend the Roads and Transport Congress and Exhibition, to be held at the Royal Agricultural Hall from November 20 to 27.

LEGAL PROCEEDINGS.—It was reported that two persons were fined respectively for breakdowns and defective vehicles on the tramway tracks. Summonses were taken out against three persons for assaulting conductors, the defendant in one case being sentenced to a term of imprisonment and in the other two cases fines were imposed. A passenger was summoned for refusing to pay his fare or give any address and was fined. One person was fined for spitting on a tramcar and another for using offensive language toward a motorman.

MR. W. J. SQUIRES, chairman of the Highways Committee, said that the experience gained in connection with the issue of season tickets to officials did not incline the Committee in favour of the issue of such tickets to the public.

ENGLISH ELECTRIC COMPANY'S EXPANSION.

PURCHASE OF THE SIEMENS WORKS AT STAFFORD.

It is announced that the English Electric Company has bought the Siemens works at Stafford. This marks a further important stage in the development of the policy of the English Electric Company, which, as formed early in the year, represents the consolidation of the interests of Dick, Kerr & Co., the Coventry Ordnance Works, Willans and Robinson and Phœnix Dynamo.

The comprehensive scheme of the amalgamation places the company in a position not only to undertake contracts of any magnitude or description in world-wide competition, but to arrange for the scientific sectionalising of the various manufactures of the group with a view to the maximum efficiency in production at the several works in Preston, Coventry, Bradford, Scotstoun, Rugby, and now Stafford.

A working agreement has been entered into between the English Electric Company and Siemens Brothers and Co., providing for the preferential exchange of the special products of each. Thus both companies benefit, as both now command the supply of a greater variety of manufacture than hitherto.

Electricity Bill.—In the Standing Committee on the Electricity Bill on November 6th, an important amendment was carried against the Government. Clause 16 provides that the powers and duties of district electricity boards might be delegated in special cases to any authorised existing undertaking or to a company established for that purpose. The amendment, which was carried, although opposed by the Home Secretary, omits the words "or company established for that purpose."

Standard Gauge Advocated for Light Railways.—At a recent meeting of the Light Railway Committee of the Holland, Lincolnshire, County Council, a report was received from the Council's engineer with regard to various schemes for the area. The standard gauge was advocated in the report, and the Committee expressed themselves strongly in favour of this gauge as opposed to the narrow gauge which was recommended by Major-General Nash to the Board of Agriculture. It was agreed to press the point at a conference to be held with the Board of Agriculture.

MISCELLANEOUS NEWS AND NOTES.

New Cars for Rochdale.—Rochdale Corporation proposes to purchase ten new cars at an estimated cost of over £20,000.

Snowfall Affects Berlin Service.—There was a heavy snowfall in Berlin on November 10th, and the tramway services were maintained with great difficulty.

Improved Service at Cardiff.—On November 10th improvements were made in the Cardiff tramway services, and additional cars are now run on all sections from 5 a.m. to 11 p.m.

Women Conductors in Sheffield to Retire.—Demobilisation of women conductors at Sheffield has been going on gradually since the armistice, and by the end of the present month it is expected to be complete.

The London Traffic Advisory Committee held its first meeting in private on Monday, under the chairmanship of Mr. Kennedy Jones, M.P. It is understood that three sub-committees will be formed to deal with different branches of the subject.

Through Running at Sunderland.—The Sunderland Corporation Tramways Committee have decided to recommend the Council to adopt the scheme of through running powers with the Sunderland and District Tramways Company, subject to agreement on certain matters.

Industrial League and Council. The fourth lecture of the present series arranged by the Industrial League and Council will be held in the Council Chamber of the Guildhall on Tuesday, November 18. The Lord Mayor will take the chair at 4.30 p.m., and Sir Auckland Geddes will deliver an address on the "Industrial Outlook."

Damages against the L.C.C.—At Shoreditch County Court on November 6th a girl was awarded £100 damages for injuries received in a tramcar accident. She was alighting from a car at the corner of Kirkland Road and Richard Street when it suddenly started and she fell, receiving a compound fracture of the skull.

Tramway Shelter for Accrington.—Mr. Thomas Gordon, J.P., a former citizen of Accrington, has sent to the Mayor of that town a cheque for £150 for the erection of a tramway shelter. He states that he has given the shelter as a token of his appreciation of Councillor Moffit's election to the position of chief magistrate.

Southport Tramway Staff Reduced.—On the ground of economy the inner circle service has been withdrawn and as a consequence the staff is being reduced by about 10 men. The services of all women employed during the war were dispensed with some time ago. The inner circle service will, however, be resumed in the spring and summer months by what is known as the grand tour cars.

Proposed Extensions at Halifax.—An extension of the Halifax Corporation tramways is proposed, and a Bill will probably be promoted in Parliament next session to obtain powers for the construction of tramways from the Calder and Hebble Inn, Huddersfield Road, to Halifax, and from Halifax to a point near Elland, and from Hepden Bridge to Whitely Arches. Power will also be sought to increase the present maximum tramway fares.

Omnibuses for Middlesex County Council.—At a meeting of Middlesex County Council on November 12, it was decided to promote a Bill next session to enable the council to own and run omnibuses in the county of Middlesex or within the limits of the Metropolitan police area. The council also agreed to apply for sanction to construct additional tramways, providing through running, coupled with a proviso that they should have power to lease the whole or part of either of the undertakings.

L.C.C. Deputation on Tramway Powers.—A deputation from the London County Council waited upon the Minister of Transport on November 6th in connection with the scheme of the London County Council for tramway extensions. Questions with reference to parliamentary procedure were placed before Sir Eric Geddes, with the proposal that some independent authority should be set up for the purpose of considering tramway schemes for London as a whole. At present, while the County Council can bring forward proposals for new lines, the local authorities through whose districts the lines will run have the power to veto the proposals.

Opposition to Tramways in Victoria Street.—A meeting of property owners held at Caxton Hall on November 12 decided to oppose the clause in the London County Council Bill asking sanction to construct tramways from Victoria to Westminster Bridge. Sir Robert Perks stated that the trustees of the Central Hall were opposed to the scheme, and Councillor Alldridge, of the Westminster City Council, said he was sure the scheme would meet with unanimous opposition at their next meeting. Major Pawley, the architect of the proposal to rebuild the southern part of Westminster as a war memorial, announced he had suggested to the County Council that instead of extending the tramways along Victoria Street, a new road should be made from Victoria Station to Lambeth Bridge, which would provide a straight route to London Bridge.

Toledo's Protest Against Increased Fares.—A curious situation has arisen in the City of Toledo, Ohio. The company, which works the street railway system, had recently raised its fares, and the City Council considered that this has been done without sufficient reason. A "Times" telegram states that on Saturday night, November 8th, the Council issued an order directing the company to cease its services. The company accordingly ran its cars out of the city and over the State boundary, so that on the following morning the citizens found themselves without a tramway service and were then at the mercy of the owners of motor cars, lorries and taxicabs, which swarmed on the streets and gave an emergency service. The fare which the company wished to charge is 5d., but those who provided an emergency service charged three or four times that amount.

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Proposed Electric Railway from Madrid to Valencia.—The Public Works Office has fixed January 19, 1920, as the latest date for receiving tenders for the concession to construct and work an electric railway from Madrid to the Port of Valencia.

Damages Against Yorkshire (W. R.) Tramways.—Damages to the amount of £69 3s. 11d. were awarded to Messrs. Ind, Coope and Company at Wakefield County Court on October 28, against the Yorkshire (West Riding) Tramways Company, in a claim for £100 damages incurred through one of the company's cars running into a motor lorry belonging to the plaintiffs.

Jamaica Built Tramway Cars.—The West India Electric Company, Ltd., has constructed in its shops at Kingston, Jamaica, a body for an electric tramcar. The *Times* states that native labour only was employed, and mahogany and mahoe were used for the roof and body respectively. It is stated that the cost of manufacture was less than the cost of an imported vehicle, and it is expected that other cars required for the Kingston and St. Andrew tramway will be built locally. The electrical equipment will be imported.

Motor Lorries Clearing the Docks.—The motor lorry service organised by the Ministry of Transport to assist in dealing with the congestion at the ports is reported already to have done good work. In London the lorries are said to have cleared large quantities of goods. At Liverpool the lorries are operating over a radius of 25 miles from the docks, and they run as far as Manchester when required. The scheme is to be extended and another fifty lorries are to be sent to Liverpool. In Manchester fifty lorries are operating within 25 miles of the docks. In Bristol one hundred lorries are working, and at Hull a radius of over 40 miles is operated.

Who are Workmen?—A representative meeting of clerical staffs and non-manual workers in a Welsh town recently resolved to take action with a view to remove the hardship imposed on those classes by the recent order respecting workmen's fares. In this, passengers who could not claim to be manual workers, are not allowed the privilege of workmen's fares. This has resulted in hundreds of clerical workers with small salaries having to pay about three times as much for long distance journeys as artisans in receipt of much higher wages. The meeting resolved to approach the Tramways Committee and press for the removal of what is regarded as unfair restriction.

Middlesborough, Stockton and Thornaby Tramways.—The transport system of these three boroughs is to be worked under two separate boards, one for Stockton and Thornaby and the other for Middlesborough. Arrangements will be made for running powers over each other's routes, and there will be an equitable division of cars. The scheme is described as being very similar to that which is common among railway companies, and each board will be responsible for its own portion of the system. A separate manager will be appointed for each area. As mentioned in a recent issue, Mr. H. G. Jeken has been appointed manager for the Middlesborough Corporation tramways.

Railless Traction on Teeside.—The railless system of electric traction linking up the principal Teeside towns with the outlying districts of North Ormesby, South Bank, Normanby and Grangetown was opened on November 8th. Councillor W. G. Grace, chairman of the joint management committee of the owning authorities, drove the first car out of the shed, after which the guests were conveyed in railless cars over the whole system. The overhead work has been constructed by Messrs. Clough, Smith & Company, and the system is that of Railless, Ltd., who have supplied the cars. The undertaking is controlled by a committee of six, three members being appointed by Middlesborough Corporation and three by Eston Council.

Traffic Chaos in the City of London.—The *Financial News* commented strongly, in a recent issue, on the muddled traffic in the city of London, which it says, "gets worse every hour and now stands for chaos." The police seem to be ineffectively instructed. If the driver of a slow vehicle offensively nurses an omnibus or wantonly draws across its path, he will "generally meet the remonstrance of the driver of the omnibus with a volley of blasphemy, or else with jeering abuse." A few summonses followed by smart sentences might put an end to this form of insolence, but it would not, of course, remedy the traffic chaos. As things are, the slow and heavy traffic is indiscriminately mixed all over the city with the motor omnibus and taxicab, with the inevitable consequence that enormous delays take place.

Woods Gilbert Rail Remodelling System.—A Woods Gilbert machine of the latest type is now carrying out certain work on the track of the London County Council tramways at Hammersmith. This machine is quite different in design from previous models, and it is doing the first milling work that has been undertaken with this design of machine. It is engaged on the removal of high checks and is working at an average speed of 100 ft. per hour Previous to being transferred to the L.C.C. work the same machine was engaged for the past three months on the track of the London United tramways, but its place has now been taken by one of the older type. The Woods Gilbert Rail Remodelling Company is now carrying out other contracts, including the Isle of Thanet tramways and the Manchester Corporation. At Manchester the work consists of the removal of corrugations preparatory to treatment of the rails by the Sandberg sorbitic process. The work is being completed so rapidly that it has been necessary to transfer the machine to other sections where the sorbitic treatment is not yet being adopted. This machine removes corrugations at an average speed of about 150 ft. per hour.

Effect in America of Higher Fares.—The *Electric Railway Journal* of New York states that the fare increases are giving the managers sufficient encouragement to send out feelers for prices and deliveries, and there are reasons to belive that a buying movement will follow. The installation market is described as active. In addition to a good domestic demand a considerable amount of business is being transacted in Europe. Orders for cars are, however, light.

Speed of Tramway Cars.—It is often said by the advocates of the motor omnibuses that their speed is quicker than that of tramway cars, amounting in some instances in London, to two miles an hour. It should be noted that whereas tramway speed is at times less than that of motor omnibuses, tramway cars serve the convenience of the people by frequent stoppages, and they run within their legal speed. There is no reason other than that of public safety why a higher speed cannot be given on tramway routes. The statement that the motor omnibuses are safer to pedestrians is not true. The tramcar, being confined to a known portion of the roadway, is a less dangerous feature of traffic than any vehicle whose course is fortuitous and cannot be foreseen.

Wages Increased at Cork.—The Cork Conciliation Board has secured a settlement between the Cork Electric Tramways Company and its employees. The men demanded an increase of 10s. a week and a reduction in the number of working hours. As a result of the arbitration which was brought about by the Conciliation Board all employees of the company, numbering about 150, will receive an increase of 5s. a week, and the working hours of conductors and drivers are reduced from 8 hours 40 minutes to 8 hours 15 minutes, and from 8 to 7 hours on Sundays, with a day off in every 10 instead of every 12 days. The foremen's hours are reduced from 52 to 51, and those of the yardmen and other employees to 48½. The advance in wages is to be retrospective from October 8th.

Car Overturned at Glasgow.—On November 10th a Glasgow Corporation car, proceeding along London Road, collided with a wagon loaded with a 22-ton casting which was being drawn by two traction engines. The engines, after allowing a tramcar to pass, were crossing the road when the accident occurred. The car was overturned and fell on the pavement, the upper part of the car completely smashing the front railings of a two-storey building. There were about twenty passengers in the car, and nine persons were taken to the Royal Infirmary, two being detained there. Several passengers had remarkable escapes from serious injury. One lad was pinned between the broken woodwork of the top deck of the car and the pavement and was released with difficulty. Traffic on the route was held up for several hours, and the damaged car was finally drawn clear of the rails by the traction engines.

Wages at Gloucester.—At a meeting of the Electricity and Light Railways Committee of Gloucester Corporation, the engineer and general manager, Mr. F. H. Corson, reported that he had received a letter from the branch secretary of the Amalgamated Association of Tramway and Vehicle Workers, asking that the recent award to members of the Transport Workers' Federation engaged in the tramway undertaking should be extended to the members of that Association engaged at the electricity station. The engineer stated that he had replied that the matter should be dealt with by the Joint Industrial Council established for the electricity supply industry. Referring to the wages award, the chairman of the Committee said that since the estimate for the current financial year had been framed they had had the 48-hour week agreement, which was costing the Corporation £1,550. With the war bonus claims allowed they had an additional expenditure to meet for wages of over £5,000 above the sum estimated for in March last. Their revenue was not keeping pace with this large growth in expenditure.

CONTRACTS.

Cammell Laird & Co., Ltd., have received an order from the London Electric Railway for trailer cars, and from the Central London Railway for bogies.

Tilling-Stevens, Ltd., of Maidstone, have received an order for seven omnibuses of their petrol-electric type from the Aberdare Urban District Council.

Bournemouth Corporation have accepted the tender of Messrs. Bolckow, Vaughan & Co. for rails, not that of Walter Scott, Ltd., as mentioned in our last issue. The order for bonds has not yet been definitely settled.

The Peckham Truck and Engineering Co., Ltd., of 10, Coleman Street, London, E.C., have recently received the following orders from Corporation tramways for their pendulum type trucks:—Sheffield, 50; Doncaster, 10; Warrington, 6; Derby, 10; Ilford, 16; Coventry, 5; Wallasey, 10; Southend-on-Sea, 13. Most of these are repeat orders. The company are also supplying a large number of sets of pendulum gear to convert rigid type trucks.

BUSINESS NOTICES.

The Peckham Truck Engineering Co., Ltd., have removed their offices to 10, Coleman Street, London, E.C. 2.

Price of A.E.C. Chassis.—Owing to the increase in the cost of labour and materials, the Associated Equipment Co., Ltd., have been obliged to fix the selling price of their chassis at £1,175.

Messrs. Mordey and Levin.—Mr. W. M. Mordey informs us that Major A. E. Levin, T.D., R.E. (T.) who was for some years associated with him and his late partner, Mr. R. A. Dawbarn, has now returned from overseas military service and has joined him as a partner. The firm will be known as Messrs. Mordey and Levin, and will carry on practice at 82, Victoria Street, London, S.W.1.

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FINANCIAL.

The Chloride Electrical Storage Company,, Ltd. announce a dividend of 5 per cent., free of tax, on the ordinary shares. The rate is the same as a year ago.

Electric Construction Company, Ltd.—The following dividends have been declared or the year ending March 31, 1920:—7 per cent. on the preference shares, less income tax, and 6 per cent. on the ordinary shares, less tax.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended November 12th amounted to £74,648, an increase of £2,024 as compared with the corresponding period last year. The route mileage was 141.67, the same as a year ago. From April 1st (the commencement of the financial year) to November 12th (thirty-two weeks and two days) the total receipts were £2,611,513, an increase of £495,744 on the corresponding period of 1918.

East Ham Corporation Tramways.—The report for the year ended March 31st last shows that the total receipts amounted to £84,848, an increase of £13,611 over the previous year. The operating costs amounted to £85,691, an increase of £21,775. There was thus a gross loss of £843 as compared with a gross profit of £7,321 in the previous year. The loss at the end of the financial year was £11,174, as compared with a deficiency at the end of the previous year of £3,376.

Sheffield Corporation Tramways.—The report of the Sheffield Corporation tramway and motor undertaking for the year ended March 25, 1919, shows that the total capital expenditure at that date amounted to £1,241,282. Since the undertaking came into the hands of the Corporation it has earned, after meeting all necessary expenditure, including interest on loans, a total sum more than sufficient to meet the whole of the capital expenditure. The total income for the past year amounted to £662,536, and the working expenses were £499,373, including £10,647 paid to dependants of employees in H.M. Forces. The gross profits were £163,163. After deducting interest and sinking fund payments and income tax there is a balance of £63,218. Of this amount £39,065 was paid to the renewals fund and various other allocations were made, while £9,228 was transferred to the general district rate and development committee. The income from motor omnibuses amounted to £45,403 and the expenditure fo £41,015, leaving gross profit of £4,388. After deducting interest, sinking fund and income tax the net balance is £83. A comparative summary of the accounts for the past four years is appended.

	1919.	1918.	1917.	1916.	1915.
Income—					
Traffic revenue	653,406	£595,159	£519,281	449,946	391,535
Sundry receipts.. .	9,130	6,286	6,404	5,663	4,341
Total income	662,536	601,445	525,685	455,609	395,876
Expenditure —					
Traffic expenses ..	245,176	189,618	155,088	132,399	120,296
General expenses ..	34,399	30,410	27,905	25,460	26,077
Repairs account ..	109,459	99,069	68,483	47,796	45,385
Power expenses ..	99,692	94,632	84,290	65,284	49,365
Total working expenses	488,726	413,729	335,766	270,939	241,123
War allowances ..	10,647	11,037	11,849	11,210	5,707
	499,373	424,766	347,615	282,149	246,830
Gross profit ..	163,163	176,679	178,070	173,460	149,044
Interest & sinking fund	66,359	65,436	64,742	63,818	73,540
Income-tax on profits	33,586	27,339	24,850	13,862	5,567
Street improvements	8,286	8,425	8,381	8,159	7,882
Renewals fund ..	39,065	36,036	34,698	30,115	30,018
Surplus fund ..	1,145	903	1,180	8,049	7,163
Special purposes fund	4,500	2,000	2,000	2,000	2,000
Grant to Sheffield University	——	——	——	5,000	——
On capital account	933	417	1,175	601	—
Relief of rates ..	9,229	36,122	40,298	41,856	22,876
Mileage of track ..	79	79	79	79	79
Passengers carried ..	163,799,188	153,506,213	142,551,547	123,429,410	107,023,195
Fare per passenger ..	.958d.	.930d.	.870d.	.878d.	.878d.
Car mileage	9,468,186	9,761,994	9,662,012	8,867,726	8,810,252
Units per car mile ..	2·425	2·378	2·327	2·172	1·979
Power cost per car mile	2·527	2·327	1·765	2·094d	1·189d
Traffic receipts per car mile..	16·563d	14·632d	12·899d	12·176d	10·664d
*Expenses per car mile	12·388d*	10·172d*	8·340d*	7·333d*	6·568d*
*Ratio of expenses	74·699%*	59·489%*	64·451%*	59·926%*	61·116%*
Number of cars in stock	350	347	349	339	339

* Excluding War allowances.

MUNICIPAL GARAGES.

A TASK FOR SHEFFIELD TRAMWAYS COMMITTEE.

The Water Committee of Sheffield City Council have recommended that the Tramways and Motors Committee be instructed to consider the question of establishing and maintaining a central motor garage from which motor-cars required from time to time for the official use of the various committees and departments could be supplied. The expenditure would be recouped by the respective departments being charged for cars used, and that if a central garage is established the various motor-cars at present provided for the use of several of the Corporation's officials should be taken over by the Tramways and Motors Committee.

Economy of Electric Traction.—Mr. Roger T. Smith, in his inaugural address as President of the Institution of Electrical Engineers, on Thursday evening, said the general electrification of railways was bound to come. In this country it would save between seven and eight million tons of coal a year. Steam-driven passenger trains at present cost 2s. per mile hauled, and goods and minerals trains 4s. 8d. With electric traction the cost would be 1s. 2d. and 3s. per mile respectively.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1918.	Incr. or Dec.
Aberdare U.D.C. ..	Nov. 4	497	534	+ 37	31	17,116	+ 1,434
Aberdeen Corporation ..	,, 5	2,421	3,080	+ 659	22½	77 115	+ 16,647
Ayr Corporation ..	,, 8	377	448	+ 71	25	20,936	+ 4,147
Belfast City	,, 7	8,590	10.110	+ 1,520	32	330,849	+ 70,760
Birkenhead Corporation	,, 9	2,132	2,875	+ 743	31½	93,617	+ 22 361
Birmingham Corporation	,, 1	24.207	26,211	+ 2,004	31	798,514	+ 67,023
do. Motor Buses	,, 1	1,369	1,615	+ 246	31	54,360	+ 7 642
Blackburn Corporation ..	,, 5	1,616	2,00)	+ 384	32½	76,333	+ 16.671
Bradford Corporation ..	,, 8	8,739	10.673	+ 1,934	32	368,508	+ 69,405
Burnley Corporation ..	,, 8	2,166	2,978	+ 812	..	..	..
Burton-on-Trent Cor. ..	,, 9	374	477	+ 103	32	16,142	+ 2,960
Bury Corporation ..	,, 9	1,866	2,210	+ 344	31½	77,647	+ 10 828
Chatham & District ..	Oct. 30	1,142	1,354	+ 212	43	66,1.0	+ 9,201
Cork Electric	,, 30	548	721	+ 173	43	30,446	+ 3,272
Derby Corporation ..	Nov. 8	1,400	1,882	+ 482	32	62,337	+ 13,736
Dundee City	,, 5	1,814	2,470	+ 656	24½	64,476	+ 15,773
East Ham Corporation ..	,, 8	1,471	1,910	+ 439	31½	62 007	+ 12.668
Edinburgh	,, 1	8,233	9,908	+ 1.675	17½	203,889	+ 39 486
Glasgow Corporation ..	,, 8	28,658	31,971	+ 3,313	23	748,822	+ 86.564
Glossop (U.E. Sup. Co.) ..	,, 8	166	215	+ 49	45	10,083	+ 1,974
Huddersfield Corporation	,, 8	3,486	4,599	+ 1.113	32	157,967	+ 34 855
Ilford U.D. Council ..	,, 8	885	1,067	+ 182	31½	38 679	+ 6,641
Ipswich Corporation ..	,, 8	549	806	+ 257	32	30.636	+ 5,467
Isle of Thanet	,, 5	255	490	+ 235	5½	3,295	+ 1,648
Kilmarnock Corporation	Nov. 8	258	262	+ 4	25½	7.314	+ 752
Lanarkshire	Oct. 30	3.780	3,902	+ 122	43	160,535	+ 3,815
Leeds City ..	Nov. 8	12.660	15,730	+ 3,070	32	534,111	+ 105,660
Leicester Corporation ..	,, 2	4,298	5,827	+ 1,529	..	..	..
Leyton U.D Council ..	,, 6	2,210	2,814	+ 604	32	101.051	+ 27,232
Liverpool Corporation ..	,, 1	19.483	23,681	+ 4.198	43½	972.239	+ 177,827
London County Council ..	,, 12	72,624	74,648	+ 2,024	32½	2,611,513	+ 495,744
Maidstone Corporation ..	,, 6	232	330	+ 98	31½	12,653	+ 3,467
Manchester Corporation	,, 8	26,148	29.433	+ 3,285	32	977,730	+ 147,549
Newcastle-on-Tyne Cor.	,, 8	8,875	9,019	+ 143	31	315 691	+ 12.963
Northampton Cor. ..	,, 7	830	1,230	+ 400	32	40 611	+ 13.131
Nottingham Corporation	,, 6	5,406	7,029	+ 1,623	32	229,136	+ 44,279
Oldham Corporation ..	,, 9	3,256	4,211	+ 955	33	147,295	+ 31,474
Reading Corporation ..	,, 6	1,078	1,435	+ 357	32½	50 809	+ 8,999
Rotherham Corporation	,, 5	2,342	2,138	— 204	31½	66,503	— 7 639
Sheffield Corporation ..	,, 9	12,6.0	15,924	+ 3,294	32½	535,9.1	+ 95,8 .2
Southampton Cor. ..	,, 5	2,422	2,304	— 118	31½	85,863	+ 4,352
,, Motor Buses	,, 5	..	153	..	14	1.752	..
Southend-on-Sea Cor. ..	Oct. 5	963	1,299	+ 336	32	74 252	+ 29,522
South Shields Cor. ..	Oct. 18	1,121	1,392	+ 270	29	41.690	+ 7,683
St. Helens Corporation ..	Nov. 4	..	1,536	..	5	8,329	..
Sunderland Corporation..	,, 9	2,298	2,665	+ 367	32	93,140	+ 24.258
Tyneside Trys. & Trmrds.	Oct. 29	986	1 943	— 42	18	22,927	+ 3,635
Wallasey Corporation .	Nov. 8	1,636	2,151	+ 515	31½	83,291	+ 21,978
Walsall Corporation ..	Nov. 1	1,264	1,549	+ 285	31	45,508	+ 6,994
Walthamstow U.D. Coun.	Nov. 8	1,265	1,493	+ 228	32	56,133	+ 9,433
Warrington Corporation	Sept. 25	809	924	+ 115	25	22 663	+ 3,426
West Ham Corporation	Nov. 6	4,282	5,047	+ 765	31½	171.805	+ 28,222
Wolverhampton	,, 12	1,990	2,033	+ 343	32	65,298	+ 9.388

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Nov. 11	£58,679	69,656	45	£2,633 008	+ £126,309
Ballarat and Bendigo(4 wks)	Aug. 17	2,996	2,192	20	15,991	— 410
Brazilian Traction (Mirs.)	Sept.	9,081,000	9,792.0 00	39	83,559,000	+ 5,829.000
Brisbane	Sept.	35,400	41,970	39	346 370	+ 20,516
British Columbia .. $	Sept.	575,476	684,946	13	1,994,206	+ 460.423
Buenos Aires Lacroze ..	Oct.	41,843	49,692	17	187,070	+ 21,258
Burmah Tram. & Light Rs.	Sept.	30,856	43.152	8	86,835	+ 14,144
Calcutta .. .. Rs.	Nov.	69,078	87,520	43½	..	+ 491,823
Carthagena and Herrerias	Oct.	2,525	1,465	39	26,969	— 13,957
Cordoba	Feb.	12,972	13,549	48	159,208	+ 11.492
East India	Oct.	2,044	2,855	13	8,447	+ 2,439
Hong Kong.. .. $	Sept. 27	14,106	14,254	39	573.315	+ 36,976
Kalgoorlie	June	2,747	2,646	26	15,842	— 113
La Plata	Sept.	4.999	5,540	39	51,043	+ 4,728
Lima	July	45,964	49,025	30	331,932	+ 29,742
Lisbon .. .. Escu	Mar.	238.299	276,625	..	..	..
Madras (2 weeks) .. Rs.	Oct. 31	39,598	46,552	42	838.454	+ 40,988
Manila .. .. $	Aug.	200,000	193,841	35	1,610,149	+ 170.284
Montevideo	Sept.	29,611	35,552	47	404.501	+ 57,428
Para	Sept.	23,442	24,386	43	246.012	+ 3,964
Pernambuco	Nov. 9	4,528	6,765	44½	236,472	+ 41,662
Peruvian .. .. $	July	987,300	1,058,730	..	..	..
Rangoon	Sept.	6,067	6.812	39	58,472	+ 2,892
Shanghai (2 weeks) $	Apr 23	50.760	56,755	16	447,279	+ 53,577
Singapore .. .. $	Sept. 6	14,847	15,522	36	549,443	+ 52,451
Toronto .. .. $	Sept.	1,119,925	1,124,159	39	9,318,458	— 278,139
Winnipeg .. .. $		285,670	331,246	39	2,947,060	+ 272,522

CARS, MOTORS, CONTROLLERS.

(DICK, KERR SYSTEM.)

THE ENGLISH ELECTRIC COMPANY LIMITED,

Queen's House, Kingsway, LONDON, W.C.2.

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THE
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SATURDAY, NOVEMBER 22, 1919.

A TEST FOR THE TRANSPORT MINISTRY.

If there is one aim more than another which has animated the Coalition Government in the schemes that they have set on foot for securing a suitable foundation for the new fabric of the United Kingdom, it is to eliminate evils that have arisen from party strife and from the rule of red tape in legislative matters. It ought, therefore, to follow as a matter of course that similar aims should animate the Ministry of Transport, which is perhaps the most important of the new departures. That being so, there is no reason why the Ministry should not recommend the Cabinet to accede to the requests submitted to them by the deputation of the London County Council, in order that Parliament may have an opportunity of deciding upon their tramway proposals on merit alone. To permit borough councils to continue to use their veto to shelve the linking up and extension schemes, will be to stultify two projects emanating from the Government and supported by the people of London. The first is to give the traffic of the metropolitan area freedom from congestion. The second is the carrying out of housing schemes involving an outlay of three millions sterling. If any other reason needs to be advanced for the abolition of the veto, it is to be found in the spectacle of Unionists like Lord Downham, ex-President of the Local Government Board and present chairman of the County Council, and Mr. G. H. Hume, the leader of the Moderate majority, joining with progressives and labour men in placing the authority's case before the Ministry of Transport. As an alternative, the deputation asked for the suspension of the standing orders of Parliament, in order that the Bill for tramway construction and the running of omnibuses may receive full consideration. The fear of the Parliamentary Secretary of the Transport Ministry that Parliament may view with jealousy attempts to interfere with its procedure is not well founded in view of the fact that two years ago the Committee appointed to consider private bill procedure recommended sweeping reforms. Had it not been for the appointment of the Speaker's Committee on Devolution (which has reported in favour of local legislatures) it is probable that by this time steps would have been taken to institute less cumbersome and costly methods of dealing with private bills. Another consideration, as pointed out by Lord Downham, is that the Government themselves have made far-reaching changes in procedure without consulting the House. We trust that the Government will come to the conclusion that the best method of dealing with the problem will be to act on the suggestion of the deputation that an *ad hoc* authority be set up as an emergency measure. Clearly no time should be lost in freeing London from the fetters that have helped to congest its thoroughfares and to retard its development.

ROADS AND TRANSPORT EXHIBITION.

Conferences.

The Road and Transport Conferences and Exhibition, which has been organised under the direction of the County Councils' Association, was opened on Thursday afternoon at the Agricultural Hall, by Brig.-General Sir H. P. Maybury, taking the place of Sir Eric Geddes, who was prevented from attending by a Parliamentary engagement. The exhibition has been arranged on the lines of similar exhibitions held before the war, but it has been extended by the introduction of motor vehicles for public service of various kinds. The exhibits, of which there are a great variety, completely filled the hall, and in the gallery there are exhibits in connection with the building trades. During the week of the exhibition, conferences of engineers dealing with road maintenance and associations of road users are being held. The exhibition for this reason should be of special importance at the present time, when the necessity of adapting roads to vehicles is beginning to be generally appreciated.

Lord Dartmouth presided at a luncheon at the Holborn Restaurant, previous to the opening of the exhibition, and in proposing the toast "The Ministry of Transport," said that they had obtained from the Government a separate department for the roads and the County Councils Association would do what they could to help that department. Any man who secured a reasonable contribution to the up-keep of the roads by users of mechanical transport would be regarded as a public benefactor. Sir Eric Geddes, in replying, made an important and interesting speech. The Association, he said, controlled some 28,000 miles of important main roads and these were reported to him by experts to be second to none in any part of the world. They had, however, to get more money before they could improve the roads as the needs of the country demanded. The expenditure on roads was enormous. This year the ratepayers would provide £23,000,000, and with the Government contribution £33,000,000 would go into the roads. At the present time the taxation of the users of the road was under consideration. He thought it would be a retrograde principle to go in for tolls. The view was that the user must pay on two grounds—the damage he did to the roads and the amount of use he got out of them. Somewhere upon these two bases, or upon a combination of them, he hoped the committee would find a solution. It was important that they should consider methods of using the roads which would not deteriorate them, and to a greater extent than ever it was necessary the surface of the roads should be fit for the vehicles that would travel over them

ADVISORY COMMITTEE ON LONDON TRAFFIC.

Three Sub-Committees Set Up.

The Ministry of Transport state that the Advisory Committee on London Traffic has formed a technical sub-committee of 18 members, so constituted that it can be conveniently split up into three sub-committees each consisting of six members, to study and report on London traffic problems, to define the new powers required and to make recommendations thereon.

The functions assigned to the three sub-committees will be as follows :—(1) Traffic regulations in general and definition of new power required ; (2) Improvement of existing forms of street facilities and the provision of new facilities ; (3) Passenger traffic in its technical and co-ordinated aspect.

The members of the sub-committee are as follows :—

First Sub-Committee :—Lieut.-Colonel C. H. Bressey (Roads Department of the Ministry of Transport), chairman; Superintendent A. Bassom (Public Carriage Department, Scotland Yard) ; Superintendent R. J. Halford (Executive Department, City Police) ; Mr. A. Smith (General Secretary, London and Provincial Union of Licensed Vehicle Workers) ; Mr. H. E. Blain (Operating Manager Underground Group) ; Mr. J. K. Bruce (Traffic Manager, London County Council Tramways). This Sub-Committee will consider matters relating to street obstruction and will report on the questions of prescribing maximum and minimum speed limits and of scheduling particular streets for specific purposes. It will consider also whether there should be regular stopping places for all hackney carriages and the formation of queues.

Second Sub-Committee:—Mr. J. S. Killick (Roads Department, Ministry of Transport), chairman ; Mr. A. L. C. Fell (General Manager, London County Council Tramways) ; Sir Julian Orde (Secretary, Royal Automobile Club) ; Mr. C. R. S. Kirkpatrick (Chief Engineer, Port of London Authority) ; Mr. G. A. Dutfield (President, London Cartage and Haulage Contractors' Association), This Committee will examine the existing highway accommodation

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and report on the possibility of diverting particular classes of traffic from main thoroughfares to parallel streets, the construction of new roads for either omnibus or tramway traffic, and the question of prescribing standard forms of paving and of co-ordinating periodic renewals of road surfaces.

THIRD SUB-COMMITTEE: Sir Alexander Gibb (Director-General of Civil Engineering, Ministry of Transport) chairman; Colonel C. Pinkham, M.P. (Chairman of Highways Committee, Middlesex County Council); Mr. F. Pick (Commercial Manager, Underground Group); Mr. Rees Jeffreys (late Secretary of the Road Board and Deputy Chairman of the Motor Legislation Committee); Mr. A. S. Parnwell (Assistant General Manager, Great Eastern Railway); Mr. H. H. Gordon (London County Council). This Committee will decide what should be the proper function of railways, tramways and omnibuses in the ideal London traffic scheme. It will consider the adequacy of existing facilities and the provision to be made for future traffic developments, the linking up with tramway and omnibus routes, the need of a unification of the tramway systems in Greater London, through running, and better co-ordination of services. It will be asked to recommend specific means of dealing with rush hour traffic.

Mr. J. A. C. Champion (Development Department, Ministry of Transport) is the Secretary of the Committee.

VETO OF LOCAL AND ROAD AUTHORITIES.

L.C.C. DEPUTATION TO THE MINISTRY OF TRANSPORT.

On October 7, the London County Council considered the report from the Highways Committee dealing with the veto that local and road authorities now exercise on the introduction of Bills to authorise the construction of new tramways. The recommendations, which were adopted, were:—

(i) To ask the Government to set up forthwith an independent *ad hoc* body to consider the full scheme of tramway development projected by it.

(ii) To take the necessary steps to obtain the suspension of the standing orders of Parliament so as to ensure the consideration by Parliament of the new tramways, in respect of which the Council may decide to ask authority.

(iii) To ask the Minister of Transport to receive a deputation in support of the foregoing proposals.

The deputation, which was introduced by Lord Downham, Chairman of the Council, consisted of the Vice-chairman of the Council (Mr. Andrew Taylor), the Chairman of the Highways Committee (Mr. W. J. Squires), the Vice-chairman of the Highways Committee (Lieut.-Col. A. C. H. Kennard), Mr. H. H. Gordon, Mr. G. H. Hume, Mr. A. H. Scott, Mr. J. Speakman, the chairman of the General Purposes Committee (Mr. J. W. Gilbert), and the Rev. Dr. Scott Lidgett. Owing to numerous engagements the Minister of Transport was not able to receive the deputation, and it was received by the Parliamentary Secretary to the Ministry, Sir Rhys Williams, M.P. The following report of the interview was presented to the Council at its last meeting.

The case in support of the Council's request to the Ministry was opened by Mr. G. H. Hume, who dwelt upon the great importance attached by the Council to the obtaining of a full and impartial consideration by Parliament of the important scheme of tramways development that had been prepared. He referred at length to the serious effect which had been produced by the existence of the veto in its present form on the carrying out of urgent and necessary schemes for the extension and linking up of the tramways.

As regarded the proposal for the setting up of an independent *ad hoc* body to deal with the Council's scheme of tramways development, Mr. Hume pointed out that the Council had been largely influenced by the fact that the Royal Commission, who had reported on the subject of London traffic in 1905, and the Select Committees who reported in 1913 and in July of the present year, had urged that the veto in its present form should be abolished, and had made a strong recommendation to the effect that, concurrently with this being done, some kind of independent authority should be set up to supervise and regulate London traffic. Mr. Hume pointed out, however, that subsequently to the Council resolving to ask the Government to set up a special body for the reasons before mentioned, the Minister of Transport had made an important statement in the House of Commons on October 22, 1919, as to the immediate appointment of an advisory committee to deal with London traffic matters broadly, and on the lines of the recommendations of the Select Committee on Transport. He agreed that the position was much altered by this decision of the Government at once to appoint a special committee, and he thought it probable that the machinery to be thus set up would to a large extent meet the point the Council had in view in suggesting the formation of an *ad hoc* authority as an emergency measure.

In any case he asked that the Ministry, which it was understood had been established to look after the traffic problems of the country from a general and comprehensive point of view, would take steps to ensure that the Committees of Parliament to whom the Council's Bill might be referred should have before them a report by the Ministry dealing from this wider point of view with an important and carefully-thought-out scheme of tramways development. Mr. Hume asked that in any event the Ministry would give the Council all the support in their power in respect of the request to Parliament to suspend its standing orders and so enable the Council's scheme of urgent tramways development to receive full consideration by Parliament, when it would be open to all concerned, including the local authorities, to place before the committee dealing with the tramways bill any suggestions or objections.

In reply to Sir Rhys Williams, Mr. Hume stated that it was not contemplated that the procedure suggested by the Council should in any case supersede the consideration in the ordinary course by Private Bill Committees of Parliament, although it was felt that, if it were practicable for the schemes to be considered by a joint committee of both Houses, this would be an advantageous course to adopt.

The Rev. Dr. Scott Lidgett strongly supported the request that the Ministry would assist in securing the suspension of the standing orders, so as to ensure the consideration by Parliament of the Council's proposals. He dealt particularly with the importance of those proposals in regard to the schemes which are now being carried out, or which are in contemplation, for the provision of urgently needed housing accommodation round the borders of the county of London. He pointed out that, while the Government were pressing upon the Council the need for expediting the provision of extensive additional housing, the expenditure incurred thereby would be largely nugatory unless steps were taken to provide means of communication to and from the housing estates. Dr. Lidgett said that he was not in agreement with the proposal to set up an *ad hoc* body to deal specially with the present scheme of tramways development.

Mr. J. Speakman (Labour member and a tramway employee), supported the proposal with reference to the suspension of the standing orders of Parliament to enable consideration to be given to the tramways scheme.

Sir Rhys Williams said that the Ministry were fully alive to the great importance of the matters dealt with by the deputation. He thought it right to say, however, that he could not hold out a very strong hope of the Ministry being able to assist the Council in either of the directions indicated. As regards the setting up of an *ad hoc* authority, he pointed out that the Advisory Committee that had now been appointed, and which would be getting to work at once, would have before them the Council's scheme of tramways development and would consider that scheme in relation to the general questions of traffic policy with which it was its function to deal.

As regarded the request that the Ministry should assist in obtaining the suspension of the standing orders of Parliament, he said that the Minister would, he thought, feel a considerable difficulty in intervening in such a matter in view of the jealousy with which the House viewed any attempts to interfere with its procedure, more especially since in this particular case he had only been supplied with the outlines of the scheme.

The Chairman of the Council thanked Sir Rhys Williams for receiving the deputation, and said he felt bound to point out that he could not agree with the view that the Council's request to the Government to assist in getting the suspension of the standing orders, so that its tramways proposals might be considered, could in any way be regarded as an unusual or unreasonable proposal. It merely involved the taking of a step which would ensure Parliament itself being in a position to decide upon the merits of an important scheme of tramways development, brought forward in the interests of London as a whole. The suspension of the standing orders which was contemplated was a small and unimportant matter compared with the far-reaching changes in procedure which had already been made by Parliament at the instance of the Government.

Sir Rhys Williams said that he would, without delay, place before Sir Eric Geddes the views of the deputation, including the aspect of the matter to which the chairman of the Council had referred.

L.C.C. TRAMWAY MATTERS.

At the weekly meeting of the London County Council on Tuesday several reports on tramway matters were received.

RELIEF FOR TRAMWAYS FROM ROAD MAINTENANCE.—On the recommendation of the Highways Committee, the Council agreed that application should be made to Parliament in the Session of 1920 for the Council to be relieved of the liability for the maintenance of the roadway in streets in which tramways are, or may hereafter be worked, with the exception of any rails or other works which may be used for the purpose of the tramway.

ADVISORY COMMITTEE ON LONDON TRAFFIC.—The General Purposes Committee reported that the Minister of Transport had notified the Council that Mr. G. H. Hume had been appointed a member of the Advisory Committee to assist the Ministry in dealing with matters connected with London traffic. Mr. Hume had been nominated by the chairman of the Council during the summer recess.

CONSCIENTIOUS OBJECTORS NOT REINSTATED.—The Council accepted the recommendation of the General Purposes Committee that no applications should be received for reinstatement in the Council's service from conscientious objectors who had failed to carry out their military duties.

TRACTION GEAR FOR ADDITIONAL CARS.—At the present time there are 250 cars fitted for hauling trailers, and to permit of the transfer of the cars from point to point in order to meet emergencies as they arise, the Highways Committee recommended that the number should be increased to 300. The cost of equipping 50 additional cars is estimated at £3,450. As it is desirable that the work should be put in hand without delay, the Committee recommended that tenders for the purchase of apparatus and materials should be invited from selected firms and the work of assembly undertaken by the staff of the tramways departments.

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MISCELLANEOUS NEWS AND NOTES.

Dogs on Tramcars.—Northampton Tramways Committee now charge 1d. extra when passengers take dogs on tramcars.

Breakdown on the L.C.C. Tramways.—A breakdown occurred on the London County Council tramways at Vauxhall on November 18. Several services were affected and at one time the line of cars held up extended over half a mile.

All-Night Cars Proposed at Glasgow.—A proposal for an all-night service of cars at Glasgow will probably come before the Tramways Committee at an early date. In 1914 such a service was about to be established as an experiment, when the war broke out.

Proposed Extensions at York.—The city engineer of York has presented a report on the suggested routes for completing the city's tramway system. He estimates that for four extensions, including £24,000 for cars, the total expenditure would amount to £143,517.

Salford Corporation's Bill.—Salford Corporation propose to promote a Bill in the next session of Parliament, seeking to obtain, among other things, powers to use trailer and coupled cars, to construct new tramways within and beyond the borough and to run motor omnibuses.

Stoke-on-Trent Corporation Bill.—Parliamentary notices have been issued in connection with the Bill which the Stoke-on-Trent Corporation is promoting in the next session of Parliament to obtain powers to purchase and work the light railway and omnibus undertakings of the Potteries Electric Traction Co., Ltd., and the North Staffordshire Tramways Company, Ltd.

Light Railway Projects.—Mr. A. Boscawen, Parliamentary Secretary to the Board of Agriculture, has stated that proposals for the construction of light railways have been received from nineteen County Councils and Agricultural Executive Committees. The total mileage of the suggested routes was approximately 908 miles. No work on construction has yet been commenced.

A Conductor Rescues a Child.—A child who ran suddenly from the footpath on to the tramway track at Wolverhampton, was rescued by a conductor named Foster at great personal danger to himself. At a meeting of the Tramways Committee the chairman, Alderman Sir Charles Mander, presented the conductor with a guinea in appreciation of his conduct.

Hull Cars Blocked by Cattle Drove.—A butcher was fined £3 12s. 6d. at Hull on November 14 for obstructing tramway traffic on October 29. A driver and conductor stated that the defendant with a herd of about forty cattle got in front of their car and made no effort to allow the car to pass. The cattle obstructed the car for a distance of about a mile and a half and other cars were also delayed.

Damages for Glasgow Passenger.—A settlement has been effected by the payment of £115 by the Glasgow Corporation in an action brought by Agnes W. Paul for £750 as damages for personal injuries received on August 1, 1918, in an accident in Glasgow. The complainant was a passenger in a tramcar when a horse yoked to a van belonging to the tramways plunged forward against the side of the car and smashed a window. The complainant fainted through fright when the glass was broken, and she alleged that owing to nervous shock she had been unable to do any work since.

Glasgow Tramwaymen Honoured.—Not many of the Glasgow tramway men, who on September 19, 1914, originally formed the 15th H.L.I., remained in the battalion which arrived at Dover on November 11. About 900 men answered their country's call and only some 200 are still attached to the unit, the rest of the survivors having been demobilised. The 15th H.L.I. formed for a time a part of the famous 51st Division, and the *Glasgow Record* states that it is expected the unit will be officially recognised by the Glasgow Corporation.

Omnibuses for Swansea.—The decision of the Swansea Tramways Company to withdraw an application for the extension of the tramways and to substitute powers for the running of motor omnibuses in various districts outside the borough was discussed at the Swansea Council meeting on Monday. The town clerk explained that the cost of tramways and road widening, estimated at £48,000 a mile, made the extensions too expensive to contemplate. The town clerk also said there was nothing in the proposed action to prevent the Council from constructing tramways at any future time. No Parliamentary powers were required to run omnibuses anywhere inside the borough.

Middlesbrough Corporation Tramways.—The first meeting of Middlesbrough Tramways Committee was held on November 11, when the mayor, Councillor E. Spence, who presided, stated that the Committee consisted of twenty-two members, with himself *ex-officio*. The deputy mayor, Alderman Calvert, was unanimously elected chairman, and Councillor Turner, vice-chairman. The deputy mayor said that the arbitration between the tramway company and the three Corporations (Middlesbrough, Stockton and Thornaby), would probably take place about the end of the year, and the Middlesbrough Corporation would assume control of the tramways in two or three months. Mr. H. G. Jeken, who was recently appointed tramways manager, will take up his duties at the end of November.

Ford Petrol Tramcar.—The *Daily Express* has published a despatch from Chicago stating that Mr. Henry Ford's internal combustion engine for his petrol tramcar, with which he expects to revolutionise transportation, has received its first trial in the Ford experimental shops at Dearborn. The power unit represents a new combination of functions; it is a motor, an air compressor, an electric generator and a heating and lighting plant in one. Speed tests will probably be made before the end of this month. Mr Ford has offered to turn his invention over to the city of Detroit as a solution to the transport problem there. He says that he is convinced that this motor will make possible cheaper and faster transportation.

Withdrawal of Steam Omnibuses.—In reply to a question by Major Glyn, who said that the probable withdrawal next week of all the omnibuses of the National Steam Car Company running in London would throw out of employment about 1,300 workers, of whom about 75 per cent. are ex-service men, Sir Rhys Williams stated that the London General Omnibus Company are arranging to run their own vehicles on the routes previously worked by the National Steam Company's cars. They had purchased both the Putney and the Peckham garages belonging to the National Steam Car Company, and are prepared to register any of the employees of the latter company who desire to transfer, with a view to favourable consideration of their employment. The particulars of the arrangement have already been given in these columns.

Institution of Automobile Engineers.—The reception given at the Kensington Town Hall on November 13 proved a very successful occasion and justified the Council in their endeavour to bring members into closer personal touch with each other. In reply to a telegram expressing the gratitude and loyalty of the members, His Majesty the King sent a message expressing appreciation of the valuable services rendered by members during the war. Cordial messages were also received from the Presidents of the Institution of Civil Engineers and of the Institution of Mechanical Engineers. Sir W. Joynson-Hicks took the place of Sir Albert Stanley, who was unable to attend on account of illness, and delivered an interesting address on the great responsibility which would rest upon the designer as represented by the Institution in the demand for cheaper road transport.

Proposed Purchase of Tramways by St. Annes.—The debenture holders of the Blackpool, St. Annes and Lytham Tramways Company have received a circular stating that a provisional agreement has been made with the St. Annes District Council by which that Council will purchase the whole undertaking of the company, excluding certain lands and liquid assets, at £135,000. This will enable the trustees, who have been in possession of the undertaking since 1903, on behalf of the debenture holders, to pay off these holders at par. They will, however, be unable to pay the arrears of debenture interest, although of late years the position of the undertaking has improved. The full rate of 5 per cent. interest has been paid for the last four years owing to war traffic conditions at Blackpool, but the trustees cannot hold out any certainty of this improvement continuing, owing to the higher wages and greater cost of material. The distribution of £10,000 is also recommended among the preference and ordinary shareholders, who have never received any interest. Another recommendation is that £5,000 should be distributed among the directors, managers, engineers and other officers of the company. If the proposals are agreed to, the Council will seek Parliamentary powers to purchase the undertaking.

Improvement of Leeds Service.—Alderman R. A. Smithson, chairman of the Leeds Tramways Committee, interviewed by a representative of the *Yorkshire Post* in regard to the prospective improvement in the local tramway services, said that they were going ahead as fast as they could in obtaining materials for car repairs and renewals and the building of new cars. Kirkstall Road car shops were being extended at a cost of £20,000, to enable more cars to be repaired and to provide facilities for building new ones. The difficulties were, however, enormous and could not be overcome by a wave of the hand. During the war, when a great strain was imposed upon the system, everything became more or less worn and repairs and renewals necessarily took longer than in ordinary times. The private makers of cars were faced with similar difficulties and their deliveries were very much delayed. During the war overloading and less experienced drivers had accentuated the difficulties. In January, 1914, for example, there were only four missed journeys with an average of 220 cars per day; in the same month of this year with 14 fewer cars the missed journeys from all causes had risen to seventy. This was one indication of the leeway that the department had to make up owing to the handicap of difficulties that still remained as a legacy of the war.

Office of Works Seeks to Block Tramway Scheme.—Among the new tramways for which the L.C.C. is seeking powers in the next session is one from Victoria Station to the Marble Arch, via Victoria Street, Grosvenor Gardens, Grosvenor Place and Hyde Park (the Ring). As this scheme affects Hyde Park, a preliminary intimation was sent to H.M. Office of Works, and an application was made for consent to the fixing of notices in Hyde Park of the Council's intention to seek Parliamentary powers to construct the tramway, this being necessary in accordance with the standing orders of Parliament. The Highways Committee have reported to the Council that a reply had been received from H.M. Office of Works stating that the Board viewed with alarm the proposal to construct a tramway in Hyde Park, but before coming to a definite decision in the matter they desired to have the advantage of the views of the Minister of Transport and they had communicated with him accordingly. Pending the receipt of the observations of the Minister of Transport, the Board did not see their way to authorise the posting of notices in Hyde Park. Further efforts were made to induce the department to modify its attitude, as the giving of such consent had always been regarded as a matter of form which did not in any way prejudice the position of the authority concerned. The Committee regretted to report, however, that its efforts had been unavailing.

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Tramways v. Omnibus Extension.—Alderman E. Russell Taylor was unanimously re-elected for the sixth time as chairman of the Liverpool Tramways and Electric Power and Lighting Committee at a meeting of the Committee on November 14. Mr. J. Gordon, in proposing his re-election, referred to the able manner in which he had steered the Committee through the stormy times of the past year, and said there were important matters to be dealt with that made it desirable that Alderman Taylor should again preside. In expressing his appreciation of his re-election, Alderman Taylor said that he looked forward to the coming year with some anxiety for the reason that there were many important questions which they would have to consider if their great undertaking was to progress in the future as it had in the past. They were anxious to do many things which the war had prevented them from doing before. The revision of fare stages would occupy their attention and there was the question of tramways versus omnibuses for future needs. Without expressing any opinion upon that, he would say that it would require their careful consideration, not only on account of the cost, but because of the question of the suitability of type necessary to cope with the ever-increasing traffic. Another question was the reinstatement and repair of the track. Workmen's fares and the carrying of school children would have to be considered, as well as the question of contract and transfer tickets for the travelling public. There were many other propositions that would come before them, but he believed that their great civic undertaking would not go back, but forward. On the motion of the chairman, Alderman Fred Smith was unanimously re-elected deputy chairman.

PERSONAL.

Mr. Henry H. Gordon will give a lecture at the Institution of Civil Engineers on Tuesday, at 5.30 p.m., on "Some Aspects of Metropolitan Road and Rail Transit."

Mr. S. H. Richards, late of the Calcutta Electric Supply Company, has joined the sales staff of Ferranti, Ltd., as sales engineer for the South of England.

Mr. Percy E. Rycroft has resigned his position as technical adviser to the Controller of Coal Mines, to take up an appointment with Babcock and Wilcox, Ltd.

Councillor D. W. Beaton, who has been elected convener of Aberdeen Tramways Committee, has stated that he will endeavour, as far as possible under the difficult circumstances, to develop outlying districts.

Mr. W. E. Ireland, O.B.E., rolling stock superintendent of the London County Council's tramway department, has been authorised to give evidence in the High Court on behalf of the West Ham Corporation in regard to the T. 2 G. Westinghouse controller and its use by the Council.

Mr. J. Townley has been appointed chief assistant electrical engineer of Sunderland Corporation electricity department, at a salary of £522 per annum. He succeeds Mr. S. R. Windle, who has been appointed electrical engineer of the Doncaster Corporation electricity works.

Colonel C. J. Gore, who was one of the passengers in the car on the Burton and Ashby Light Railway which overturned on October 5, has forwarded to the treasurer of the Burton Infirmary £100 5 per cent. War Loan as a contribution to the funds of the institution to mark his gratitude for escape from serious injury. Colonel Gore was alighting from the top deck when the car overturned and he was thrown into some gardens, but escaped with slight bruises.

FINANCIAL.

Edison-Swan Issue.—The subscription list in connection with the recent offer of 360,000 Edison-Swan £1 ordinary shares at 21s. 6d., was several times over subscribed.

Pernambuco Tramways and Power Company.—An issue of £200,000 8 per cent. ten year notes has been issued to the shareholders and debenture holders at par. The notes will be issued in denominations of £100 and £500, and they will be redeemable at par on January 1, 1930, and will be subject to earlier redemption at par at the option of the company at any time after January 1, 1925, on three months' notice.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended November 19th amounted to £74,817, an increase of £7,683 as compared with the corresponding period last year. The route mileage was 141.67, the same as a year ago. From April 1st (the commence ment of the financial year) to November 19th (thirty-three weeks and two days) the total receipts were £2,686,332, an increase of £503,430 on the corresponding period of 1918.

Anglo-Argentine Tramways Company.—In response to inquiries from shareholders with reference to market rumours that the company is likely to pay arrears of dividend on its first preference shares at an early date, the London manager has been authorised to state that the prospects of the company are dependent on the revision of tariffs which has not yet been authorised by the authorities, and that no question of payment of dividend can come under consideration at present.

CONTRACTS AND ORDERS.

Sheffield Corporation has accepted a tender for 75 double-deck tramway cars, exclusive of equipment, from the Brush Electrical Engineering Company, Ltd., at £82,000.

Belfast Corporation has accepted a tender for iron work in connection with the electrical station from Messrs. Orr, Watt & Co., at £39,217.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Returns. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	Nov. 11	457	516	+ 59	32	17,632	+ 1,493
Aberdeen Corporation	,, 12	2,504	2,914	+ 410	23½	80 040	+ 17,059
Ayr Corporation	,, 15	446	431	— 15	26	20,504	+ 4,132
Belfast City	,, 14	8,462	9.67 8	+ 1,216	33	340 527	+ 71,985
Birkenhead Corporation	,, 17	1,909	2,629	+ 720	32½	96,046	+ 23 082
Birmingham Corporation	,, 8	23.245	25,516	+ 2.271	32	823,960	+ 69,194
do. Motor Buses	,, 8	1,27)	1,543	+ 273	32	55,904	+ 7,915
Blackburn Corporation	,, 12	1,923	1,852	— 71	33½	78,185	+ 16 687
Bradford Corporation	,, 8	8,789	10 673	+ 1 934	32	368,508	+ 69,405
Burnley Corporation	,, 15	2,154	2,700	+ 546	..	..	..
Burton-on-Trent Cor.	,, 18	404	471	+ 67	33	16,613	+ 3,027
Bury Corporation	,, 16	1,917	1,918	+ 1	32½	79.564	+ 10 828
Chatham & District	,, 6	1,017	1,300	+ 283	44	67,410	+ 9,484
Cork Electric	,, 6	518	710	+ .92	44	31,176	+ 3,464
Derby Corporation	,, 15	1,474	1,900	+ 426	33	61 ,238	+ 14,163
Dundee City	,, 12	1.693	2.395	+ 697	25½	66,872	+ 16.470
East Ham Corporation	,, 15	1,666	1.798	+ 132	32½	62,806	+ 12 820
Edinburgh	,, 15	8 541	8,998	+ 457	19½	223,047	+ 41 765
Glasgow Corporation	,, 15	27,720	28,.89	+ 569	24	777,112	+ 85.455
Glossop (U.E. Sup. Co.)	,, 15	122	201	+ 39	46	10,284	+ 2,013
Huddersfield Corporation	,, 15	3,563	4.342	+ 779	33	162,310	+ 35.635
Ilford U.D. Council	,, 15	1,008	1,044	+ 36	32½	39.723	+ 6,682
Ipswich Corporation	,, 15	669	763	+ 94	33	31,400	+ 5,561
Isle of Thanet	,, 12	347	444	+ 97	6½	3,740	+ 1,746
Kilmarnock Corporation	,, 15	302	246	— 56	26½	7,560	+ 896
Lanarkshire	,, 6	3.603	3 831	+ 228	44	164,367	+ 4,044
Leeds City	,, 15	13.850	15,139	+ 1.289	33	549,251	+ 106,999
Leicester Corporation	,, 15	4,821	5.958	+ 1,077	..	..	..
Leyton U.D Council	,, 13	2,594	2.676	+ 82	33	103,727	+ 27,314
Liverpool Corporation	,, 15	19.672	22,748	+ 3.0 6	45½	1,018,738	+ 185,660
London County Council	,, 19	67,134	74,817	+ 7,683	33½	2,686,332	+ 503,430
Maidstone Corporation	,, 13	274	325	+ 51	32½	12.978	+ 3,518
Manchester Corporation	,, 15	25 929	28.447	+ 2,518	33	1,006,177	+ 149,977
Newcastle-on-Tyne Cor.	,, 15	6,738	8,399	+ 1,661	32	314,128	+ 14,606
Northampton Cor.	,, 7	830	1,230	+ 400	32	40,611	+ 13,131
Nottingham Corporation	,, 13	5.768	6,881	+ 1,113	33	236,017	+ 45,392
Oldham Corporation	,, 16	3,137	3,944	+ 807	32	151,240	+ 32,282
Reading Corporation	,, 3	1,145	1.457	+ 312	33½	52,357	+ 9,311
Rotherham Corporation	,, 12	2,224	2,029	— 195	31½	68,512	— 7,334
Sheffield Corporation	,, 16	18,232	15,364	+ 2,132	33½	551,346	+ 97,435
Southampton Cor.	,, 12	2,664	2,294	— 370	32½	86.157	+ 3,982
,, Motor Buses	,, 12	..	149	..	15	1.9 1	..
Southend-on-Sea Cor.	,, 5	963	1,299	+ 336	32	74 252	+ 29,522
South Shields Cor.	,, 15	990	1,420	+ 430	33	47,313	+ 8,916
St. Helens Corporation	,, 11	..	1,487	..	6	9 17	..
Sunderland Corporation	,, 16	2,100	2,506	+ 406	33	95,647	+ 24.665
Tyneside Trys. & Trmrds.	,, 5	916	967	+ .0	19	23,895	+ 3,686
Wallasey Corporation	,, 15	1,702	2,022	+ 320	22½	65,312	+ 22,297
Walsall Corporation	,, 1	1.264	1,549	+ 285	31	45,508	+ 6,994
Walthamstow U.D. Coun.	,, 15	1,441	1,429	— 12	33	57,562	+ 9,420
Warrington Corporation	Sept. 25	809	924	115	25	22 663	+ 3,426
West Ham Corporation	Nov. 13	4,824	4,824	—	32½	176 629	+ 28.222
Wolverhampton	,, 19	1,483	2 088	+ 605	32	67,386	+ 9.993

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Nov. 1?	£58,128	66,298	46	£2,699 306	+ £184,479
Ballarat and Bendigo(4 wks)	Sept 14	3,430	3,396	24	19,387	— 444
Brazilian Traction (Mirs.)	Sept.	9,081,000	9,792.000	39	83,559,000	+ 5,829,000
Brisbane	Sept.	35,400	41,970	39	346 370	+ 20,316
British Columbia $	Sept.	575,476	684,946	13	1,994,206	+ 460,422
Buenos Aires Lacroze	Oct.	41,643	49,692	17	187,070	+ 21.258
Burmah Tram. & Light Rs.	Sept.	30,826	43,152	8	86,835	+ 14,144
Calcutta Rs.	Nov 8	75,.81	92,914	44½	..	+ 511,576
Carthagena and Herrerias	Oct.	2,525	1,465	39	26,969	— 13,957
Cordoba	Feb.	12,972	13,549	48	159,208	+ 11,492
East India	Oct.	2,044	2,855	13	8,44 7	+ 2,489
Hong Kong $	Sept. 27	14,106	14,254	39	573.315	+ 36,976
Kalgoorlie	June	2,747	2,646	26	15,842	— 143
La Plata	Sept.	4,999	5,540	39	51,043	+ 4,728
Lima	July	45,964	49,025	30	331,932	+ 29,742
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Oct. 31	39,598	46,552	42	838.454	+ 40,968
Manila $	Aug.	200,000	193,841	35	1,610,149	+ 170.284
Montevideo	Sept.	29,611	35,552	47	404,501	+ 57,428
Pernambuco	Nov. 16	4,748	6,800	45½	243,272	+ 43.714
Para	Sept.	23,442	24,386	43	246,012	+ 3,964
Peruvian $	July	987,300	1,058,780	..	..	..
Rangoon	Sept.	6,067	6,812	39	58,472	+ 2,892
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore $	Oct. 4	14,817	16,389	40	611,742	+ 57.163
Toronto $	Aug	1,119,925	1,124,159	39	9,318,458	— 278,139
Winnipeg $	Aug.	235,670	381,248	39	2,947,060	+ 272,622

CARS, MOTORS, CONTROLLERS.
(DICK, KERR SYSTEM.)
THE
ENGLISH ELECTRIC COMPANY LIMITED,
Queen's House, Kingsway,
LONDON, W.C.2.

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THE
Tramway and Railway World

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SATURDAY, NOVEMBER 29, 1919.

NORTHAMPTON COMMITTEE ABDICATES.

A curious and probably unprecedented situation has followed the appointment of a chief inspector for Northampton Corporation Tramways. The vacancy was created by the resignation of a chief superintendent after a long illness, during which the work was done by an inspector. In the usual course, it was decided to make a permanent appointment, and advertisements were issued inviting applications for the post. Numerous applications were received, and after considering them the Tramways Committee recommended the appointment of Mr. Metcalfe, of Bexley Council Tramways, whom the Council duly appointed to the position. The employees, however, were dissatisfied that the acting chief inspector was not selected, and they held a mass meeting to protest against the appointment of an outsider, threatening to strike if the Council did not give heed to their protest. The employees, who are members of the Tramway and Vehicle Workers' Union, proposed to refer the matter to headquarters, but in the meantime they stated quite plainly that in future they must have a voice in all appointments of the kind. Whatever the merits of the various candidates, the men had no knowledge of their respective qualifications, and the action they took was in open defiance of the Council, who, acting on behalf of the ratepayers, the owners of the undertaking, were merely performing their duty in selecting the man they considered best qualified for the position. The Council had, it would seem, therefore, a further duty to perform—to tell the employees quite as plainly that the latter had exceeded their function and that the selection of officials must rest with the Council. The threat of a strike proved, however, too disturbing to the Tramways Committee, and at a special meeting on Wednesday the resolution appointing Mr. Metcalfe was rescinded, and apparently the dictation of the employees is to be accepted. It appears that the proposed reference of the matter to the headquarters of the Union was to be merely a matter of form, for the employees subsequently gave the committee to understand that with or without permission of headquarters they were going to strike to enforce their views of what ought to take place. Evidently the executive council of the Transport Workers' Federation, which we do not think would approve arbitrary action of this kind, has no control of the men for whom it seeks to act and for whom it has been instrumental in obtaining great advantages by pleading that it was a responsible body acting in a representative capacity. It is, therefore, useless to look to it for assistance in maintaining the undoubted rights of the Council in this matter. It is needless to point out that what the employees seek to do is to take from the Council the essential ownership of the undertaking. Ownership implies the right to conduct a business and to select such officials and servants as are deemed best qualified for the work. If the Council abdicates its function, it simply surrenders the ratepayers' undertaking to the employees.

TAXATION OF ROAD VEHICLES.

The Ministry of Transport announced on November 25 the formation of a committee to consider and report to the Minister on the question of the taxation of and regulations affecting road vehicles. The committee began its sittings on November 21. The committee consists of the following :—

Sir Henry MAYBURY.—Director-General of Roads, Ministry of Transport (chairman).
Sir George BEHARRELL.—Director-General of Finance and Statistics, Ministry of Transport.
Sir Philip NASH.—Director-General of Traffic, Ministry of Transport.
Sir Thomas BERRIDGE.—Representing Royal Automobile Club.
Mr. E. S. SHRAPNELL-SMITH, C.B.E.—Commercial Motor Users' Association.
Major STENSON COOKE.—Automobile Association and Motor Union.
Mr. F. L. D. ELLIOTT.—Police authorities.
Mr. C. W. TINDALL.—Agriculture.
Sir Harcourt CLARE.—Local authorities.
Mr. F. PICK.—London and Provincial Omnibus Owners' Association.
Mr. W. Rees JEFFREYS.—Motor Manufacturers' Association.
Mr. W. H. PASCOE.—Board of Customs and Excise.

The terms of reference include :—Taxation and revenue ; registration and licensing ; design, construction, and weight ; identification ; speed limits ; and roads in relation to (*a*) the effect of self-propelled traffic ; (*b*) the question of safety of other traffic ; (*c*) application of section 20 of the Local Government (Emergency Provisions) Act, 1916.

INCREASES IN FARES.

Edinburgh Tramways Committee have received a report from Mr. R. S. Pilcher, tramways manager, and Mr. R. Paton, the city chamberlain, on the financial condition of the undertaking. The principal suggestions include the abolition of the penny fare and the reversion to the 1½d. stages which were abolished on July 1 last, when the Corporation took over the tramways. The report states that the estimated revenue based on the present fare system for the period to May 15 next will result in a deficit of £21,000, and to meet this deficiency it is recommended that the present 1d. stages, which average 1,500 yards, be abolished and the old 1½d. stages of 1 mile 527 yards, be re-introduced, the 2d. and 3d. stages remaining as at present. Workmen's return tickets will be limited to persons travelling on cars leaving any terminus before 7.45 a.m. Even with these changes it is anticipated that a deficit of over £5,000 will remain to be carried forward. The Committee adopted the report and the new scale of fares will go before the Town Council for approval, after which application will be made to the Board of Trade for powers to increase the fares.

Bury Tramways Committee are considering the revision and increase of fares, and they have declined for the present to deal with the proposal for a through service of cars between Bury and Manchester.

Portsmouth Tramways Committee propose that fares should be increased by 50 per cent., and at a meeting of ratepayers it was suggested that the addition should be equally distributed throughout the town by the introduction of shorter stages in every part of the borough.

Halifax Corporation tramways have decided to abolish the half-penny fares for part mile distances after the first mile and to make a charge of one penny. The fares on routes over one mile in length will thus be 2d. instead of 1½d.

It is reported to be highly probable that the fares at Newcastle will very shortly be revised. Up to the present there has been practically no increase in fares at Newcastle, but with the continued increase in the cost of wages and material, revision has become essential.

The London United Tramways, Ltd., the Metropolitan Electric Tramways, Ltd., and the South Metropolitan Electric Tramways and Lighting Company, Ltd., propose to seek Parliamentary powers to increase their fares and to alter stages.

MR. ARTHUR NEAL, member for the Hillsborough division of Sheffield, will be the new Parliamentary Secretary of the Ministry of Transport. He succeeds Colonel Rhys Williams, who has resigned, and will leave the Ministry almost immediately.

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LIGHTS ON VEHICLES COMMITTEE.

The Ministry of Transport has announced the formation of a Committee, designated the "Lights on Vehicles Committee," to consider and report to Sir Eric Geddes on all questions relating to lights to be carried on vehicles and as to lighting-up time. The following constitute the Committee :—

Sir Henry Maybury (Director-General of Roads, Ministry of Transport), Chairman ; Brig.-Gen. Sir H. C. L. Holden (Royal Automobile Club) ; Mr. A. L. Dixon, C.B.E. (Home Office) ; Mr. E. S. Shrapnell-Smith, C.B.E. (Commercial Motor Users' Association) ; Lieut.-Col. Chas. Jarrott, O.B.E. (Automobile Association and Motor Union) ; Messrs. F. L. D. Elliott (Police Authorities) ; S. Straker, A.M.I.C.E. (Motor Manufacturers' Association); P. J. T. Rose (Scottish Office) ; F. Berryman (Chairman, Highways and Bridge Committee, Somerset County Council), Local Authorities ; C. W. Tindall (Agriculture) ; W. G. Howard Gritten, M.P. (Cyclists' Touring Club) ; A. L. Barber (London General Omnibus Company).

An interim report will be submitted on the requirements as to lights to be carried on vehicles and as to lighting-up time under the Lights (Vehicles) Order of December 16, 1918, which will include the question of the provision of rear red lights on all vehicles.

All communications on the subject should be addressed to the Secretary of the Committee, 6, Whitehall Gardens, S.W.1.

L.C.C. TRAMWAY MATTERS.

At the Council meeting on Tuesday, no important reports on tramway matters were received from the Highways Committee.

On the recommendation of the special committee on London electricity supply, it was decided that the special committee should confer with representatives of the conference of local authorities owning electricity undertakings in Greater London, and take any other necessary steps with a view to the preparation of a comprehensive scheme of electricity supply for Greater London, under the provisions of the Electricity (Supply) Bill.

In reply to questions, Lt.-Col. Kennard said that the cause of a block in the running of the cars at Vauxhall on the previous Wednesday, was the jambing of a plough in the conduit, a pure accident. The Highways Committee were continually putting forth every effort to increase the regularity of the service, and representations were being made to the Police for better control of the street traffic.

MISCELLANEOUS NEWS AND NOTES.

Track Work at Exeter.—Exeter Council have adopted a recommendation of the Tramways Committee that the track in Black Boy Road should be doubled and that tenders be invited for the execution of the work.

The Petrol Department, 20, Berkeley Square, London, W.1, was closed on November 22. All further communications for that department should be addressed to Mr. P. J. L. Webb, C.B., O.B.E., Patent Office, 25, Southampton Buildings, Chancery Lane, W.C.2.

Through Tramway Service Demanded.—At a meeting of the Whitley Council this month it was decided to ask the tramway departments of the Salford and Bury Corporations to arrange for a through service of cars between Manchester and Bury.

Memorial Services at Newcastle.—On Sunday, November 22, no cars were run at Newcastle until noon, in order that the employees might attend services in memory of their colleagues who gave their lives in the war. The services were held at St. John's Church and St. Mary's Cathedral, the latter being attended by the Lord Mayor and Lady Mayoress.

Fine for Obstructing a Tramcar.—The *Liverpool Courier* remarks that tramcar baiting by drivers of other vehicles is likely to prove an expensive pastime. In the case of a motor lorry driver charged with deliberately obstructing the passage of a car, the representative of the tramways department said the defendant ran his lorry just in front of the car, thereby reducing its speed to a comparative crawl. The lorry driver, who pleaded ignorance of the car behind, was fined 40s.

Permanent Way Renewals at Ayr.—Ayr tramways permanent way requires immediate renewal on a considerable portion of the routes. Mr. J. Ferguson, electrical engineer of Glasgow Corporation tramways, who was called in to report on the undertaking, states that the rails on a portion of the route and some of the cross-overs require immediate attention. The cars are in fairly good condition, although in need of repair, but several of the tramway standards are in a dangerous condition.

The Institution of Automobile Engineers.—The fourth meeting of the session of the Institution of Automobile Engineers will be held in the Hall of the Institution of Mechanical Engineers, Storey's Gate, St. James' Park, London, S.W.1, on Wednesday, December 3, at 8.0 p.m., when Mr. Edgar N. Duffield will read a paper entitled, "Car Design and Car Usage from the Point of View of the Majority of Owner Drivers." A card of invitation to the meeting may be obtained on application to the Secretary, Institution of Automobile Engineers, 28, Victoria Street, London, S.W.1.

More London Demand for Transport.—The London County Council have accepted an estimate of £108,000, subject to the approval of the Ministry of Health, for the acquisition and laying out of 250 acres at Bellingham for housing purposes. The site is somewhat larger than was originally proposed for the erection of working-class houses, but the acquisition of the total area will enable a complete scheme of development to be undertaken. Motor omnibuses and the Council's tramways run past the site and there are three railway stations near.

The Roads and Transport Exhibition, which closed on Thursday, has been well attended and it should result in considerable business to exhibitors. The Congress of the County Councils Association which took place during the week provided some interesting discussions on matters pertaining to roads.

Model Windscreen for Ford Cars.—Messrs. Morris, Russell and Company, Ltd., are offering a new Eros-Triplex screen specially designed for Ford cars at an extra cost of £3. Ford owners will thus have the advantage of safety without any extra cost to themselves, for premiums under the "Triplex Policy," issued by the British Oak Insurance Company, are exactly £2 9s. 4d. per annum less than under any ordinary policy. The extra cost of fitting Triplex safety glass is thus saved in the first year's premium.

Advertising Campaign at Ilford.—With commendable enterprise Ilford Council has entered on an advertising campaign. On all the tramway standards notices have been affixed printed in red :—

"Use your own trams."
"Your tram receipts pave your streets."
"Your trams are not on the rates now—do your bit to keep them off."
"The trams are yours ; use them."

New Tramway Depot at Sheffield.—Work on the new tramway depot in Pickmere Road, Sheffield, is proceeding rapidly, but delivery of material has at times been delayed and consequently the depot will not be ready as early as was expected. It will be the second largest in Sheffield, the Shoreham Street depot, with accommodation for 110 cars, being the largest. The new depot will be 200 ft. in length and 150 ft. wide, and will accommodate 66 cars. The total cost will be about £35,000. The front is of stone and brick and will have six entrances.

Fine for Avoiding Payment of Fare.—A girl has been fined 10s. by a Blackpool magistrate for attemping to avoid payment of fare. On behalf of the Corporation, it was stated that an inspector on boarding the car pointed out to the defendant that the ticket only carried her to Manchester Square, and that she would have to pay another penny. When she was leaving the car she gave a false address. Mr. J. W. T. Loftus, who prosecuted on behalf of the Corporation, said that the practice of over-riding was difficult to prevent and should be stopped.

Manchester Cashier's Defalcations.—At Manchester Assizes on November 26, John William Hewitt (43), cashier in the Manchester Corporation tramways department, was sentenced to three years' penal servitude for stealing moneys and falsifying accounts. The total defalcations amounted to £5,000. Mr. Eastham, who prosecuted, said that a civil action had been started to recover £4,000, and he understood that the prisoner was making some effort to repay some of the money. Large sums passed through the prisoner's hands each week, amounting to £30,000 in receipts and £17,000 in wages.

Official Attitude Towards L.C.C. Tramway Extensions.—Sir A. Mond, First Commissioner of Works, stated in the House of Commons that he had refused permission to the London County Council to post notices relating to the Parliamentary Bill that the Council is promoting for a tramway through Hyde Park. In any case it was not customary to place such notices upon a Crown property. As custodian of the Royal Parks he felt that the introduction of tramways into Hyde Park would be highly detrimental to its amenities and to its enjoyment by the public.

Bradford Tramway Employees' Club.—The chairman of the Bradford Tramways Committee and the tramways manager have promised their support in the formation of a social and athletic club for the Corporation tramway men. The club will encourage indoor and outdoor games, and refreshments will be provided on the club premises. Subscriptions not exceeding 2d. a week will be deducted from the members' wages and handed over to the club. In some towns the Tramways Committee provide and furnish the rooms as tramwaymen's clubs, and pay the wages of the attendants.

Opposition to London Tramway Scheme.—Strenuous opposition to the L.C.C. tramway scheme from various interests is being aroused. Property owners have protested against the proposal to lay tramways in Victoria Street, and it is suggested that instead a new road should be made from Victoria Station to Lambeth Bridge. A Committee has been appointed to oppose the Bill in Parliament, and property owners on the route urge "the necessity of fighting the proposal tooth and nail" on the ground that the tramways would greatly depreciate the value of the property.

Manchester's New Rolling Stock.—Mr. J. M. McElroy, general manager of Manchester Corporation tramways, recently stated that during the past five or six months they had been building cars with all the energy they possessed, and they had turned out twenty-four bogie cars of a new type with covered tops and vestibule ends, each capable of accommodating eighty passengers. By the end of the financial year in March next they hoped to complete another seventeen cars. An order had also been placed with a firm of car builders for an additional fifty car bodies, and trucks and electrical equipment had been secured for them. The whole difficulty of getting additional bodies was due to the lack of skilled bodymakers and men engaged in the coachbuilding trade. They could use more skilled men at the Hyde Road shops. They were also to advertise for tenders for fifty car bodies in addition to those already ordered. Relief would be gradual but they trusted during the coming year to do a great deal towards minimising the inconvenience which the public were now suffering. The traffic had increased enormously ; in 1909 the number of passengers carried was 150,000,000. For the year ended March 31, 1919, it was 254,000,000.

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Electric Traction in India.—A resolution in favour of the electrification of the suburban railways within a radius of 25 miles of Calcutta has been adopted by the Legislative Council of India. Mr. G. Barnes said the Government recognised the importance of improving the train service to the suburbs and they had no hesitation in accepting the motion. It is proposed to call together representatives of the three large railway systems (Eastern Bengal, East Indian and the Bengal Northern Railways) and to ask representatives of the Chamber of Commerce to meet them, when the whole question would be discussed.

Proposed Light Railway in the East Riding.—An application is being made to the Light Railway Commissioners for authority to construct a light railway from Warthill Station to Scrayingham, in the East Riding. The line will be six miles in length and the motive power will be steam or such other motive power as the Minister of Transport may approve. The object of the promoters is to assist farmers in transporting their produce to the main line of the North Eastern Railway. The promoters include Sir Robert Walker, Major E. F. W. Herbert and Mr. H. A. Watson, general superintendent of the North Eastern Railway.

Loss on Workmen's Cars at York.—Mr. J. W. Hame, tramway manager, in reporting to the York Tramways Committee on the cost of running workmen's cars, states that the number of workpeople carried per week averaged 19,098, and the income therefrom, 9.43d. per car mile. The working expenses, not including the proportion of interest and sinking fund charges, are 15.56d. per car mile. The average receipts per passenger are 1¼d. and the cost per passenger 2d., exclusive of interest and sinking fund charges. The deficiency on the workmen's traffic at present is £2,768 per annum, apart from any capital charges. The manager has been instructed to report as to any unexercised power the Committee possess in regard to workpeople's fares, and he has been asked to suggest what further powers should be obtained.

The Electricity Supply Bill on Tuesday, after a brief discussion, passed the report stage in the House of Commons. Important changes have been made in the Bill since its introduction which have made it more satisfactory to local authorities. In Committee an amendment was carried against the Government, substituting the Board of Trade for the Ministry of Transport as the supreme authority. On the report stage, however, the Ministry of Transport was again constituted the authority to deal with the future of electricity supply. Probably no one will regret the decision, for the Board of Trade, instead of fostering electrical development, has in the past actually checked development. Railway companies are naturally a little anxious to know what the control of the electricity commissioners will mean to them.

Motor Omnibus Derails Tramcar.—At Norwich County Court on November 17, the Norwich Electric Tramways Company sued the United Automobile Services, Ltd., of Lowestoft, for £31 2s. 6d. damages alleged to have been caused by reason of the negligent driving of a motor omnibus on August 16 last. It was stated that the collision took place in Thorpe Road, where there is a single line of tramway track and the distance between the line and the left side of the road going up the hill at the place of collision was about 8 ft. The tramcar was proceeding towards Thorpe when one of the large motor omnibuses, measuring 7 ft. 3 in. in width, came behind the tramcar. The omnibus scraped along the tramcar and although the driver of the tramcar slackened speed, the omnibus driver continued and the tramcar was thrown off the metals.

Lorry Driver Causes Collision.—At Wakefield on November 18 the Yorkshire (W.R.) Electric Tramways Company were sued by Messrs. J. Harrison and Sons, fruit and potato merchants, for damages to a motor wagon alleged through negligence on the part of one of the tramcar drivers. The tramway company counter-claimed for £5 9s. 9d. damages. For the plaintiffs it was said that the driver of the van was obliged to pull up on the tramway line to allow another vehicle to pass. At the same time a tramcar ran into him. For the tramway company it was shown that owing to the tramcar approaching a blind corner the motor wagon stopped practically under the nose of the driver, who had only about six yards in which to pull up. He succeeded nevertheless in minimising the collision. Judgment was given for the company on the claim and also on the counter claim.

Mass Production of Motor Vehicles.—Several speeches of much interest were made at the inaugural luncheon on Wednesday of Harper, Bean, Ltd., regarding the plans of the company for the mass production of motor vehicles. Mr. J. H. Whitcomb, chairman of the British Motor Trading Corporation, said that in Harper, Bean, Ltd., they had an amalagamation of well-known firms producing every component of the motor car. Their essential aim was to produce a low-priced British car of high quality and finish. They were making the first really effective effort to place the industry on a scale of production comparable to the mass production of American firms. They hoped to commence with an output of 600 cars per week and work up to 2,000 per week in 1923. They would produce cars for the multitude—50,000 small cars, 25,000 medium cars, and 25,000 chassis for commercial vehicles. Sir Robert Hadfield said that the resources of the Hadfield Works were at the disposal of the new company, and would give them all the steel required. Sir Robert announced that the feat had been accomplished of getting the largest calibre of armour-piercing shell unbroken through the thickest of modern armour plate. That would make the British big gun, weighing something like 180 tons, unsurpassable in naval battles.

Workmen's Tickets at Bexley.—In the course of a report on the Bexley tramway undertaking, the general manager, Mr. J. Makin, has suggested that the position of the undertaking might be improved by various alterations. In order temporarily to meet the deficit, he recommends the abolition of the workmen's weekly tickets, which would result in an increase of £2,000 per annum in revenue. He does not propose to interfere with the workmen's daily tickets, except to extend their issue from 8 o'clock to 8.30. The reorganisation scheme would include the discharge of those who have filled men's places during the war. It would be necessary to dispense with the services of the war period workers, as this would mean a saving of £400 a year, and their places would be taken by returned service men.

Railless Electric Traction at Shanghai.—Since 1915 the Shanghai Electric Construction Company, Ltd., has worked a railless trolley omnibus route over a mile in length. During last year 5¾ million passengers were carried by seven railless vehicles. As many of the busy thoroughfares are too narrow for tramways, the Municipal Council is negotiating with the company for the extension of the railless system, which it is suggested should also be used for goods transport. To meet the increasing traffic requirements, seven new railless cars are being built. The *Indian and Eastern Engineer* recently reported that the average tire mileage obtained from the seven cars in use up to the end of 1918 was as follows:—front tires, 23,796 miles; rear tires, 24,960 miles. In addition to the railless system the Council has 16.5 miles of electric tramways and a fully illustrated account of the undertaking was given in our issue of September 13, 1917.

Cardiff Corporation Tramways.—Sir John Courtis presided at the first meeting after the election of the Cardiff Tramways and Electric Lighting Committee on November 21 when it was reported that the City Council would be advised to separate the offices of electrical engineer and tramways manager, the former to be responsible for the generation of the current and the latter for the application of the current from the switchboard to the cars. Mr. Arthur Ellis, who is relinquishing at the end of the year the position of electrical engineer and general manager of the tramways, which, he has held for nearly twenty years, in order to take up private practice as a consulting engineer, was accorded a unanimous vote of appreciation of his valuable services, and the vote was ordered to be recorded on vellum. In the course of a discussion on the cost of track construction, it was stated that the Corporation had to pay £2,525 as excess profits duty and the chairman said he did not think it fair to assume that the profits would remain what they appeared to be at present, because the works they had in contemplation might cost more than was anticipated. Before the war to construct a mile of double track cost about £14,000. The cost would now be from £25,000 to £30,000. They had put aside a large sum every year for reconstruction but he was afraid they would find it would be very much short of what they would require. Mr. Ellis said that if the traffic remained at its present point they could find plenty of work for 200 cars. At present the Corporation own 130 cars, of which 100 are now in regular service.

FINANCIAL.

Indian Electric Supply and Traction Co., Ltd., have announced an interim dividend of 3 per cent. on the ordinary shares.

Torquay Tramways Company.—The ordinary shares of £1 each fully paid, of which there are £120,000, have been placed by the Stock Exchange Committee on the list of officially quoted securities.

British Electric Traction Company, Ltd.—A dividend has been announced of 6 per cent. per annum on the preference stock for the half year ended September 30.

Harper, Bean and Company, Ltd., has been registered with a capital of £6,000,000 in £1 shares (3,000,000 8 per cent. cumulative preference and participating) to carry on the business of manufacturers and dealers in motor cars, vans, carriages, omnibuses and other vehicles. A prospectus will be issued early next week.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended November 26th amounted to £76,601, an increase of £10,356 as compared with the corresponding period last year. The route mileage was 141.67, the same as a year ago. From April 1st (the commencement of the financial year) to November 26th (thirty-four weeks and two days) the total receipts were £2,762,929, an increase of £513,782 on the corresponding period of 1918.

CONTRACTS AND ORDERS.

Bournemouth Corporation have accepted the tender of the Forest City Electric Services Supply Company for rail bonds.

Bradford Tramways Committee have decided to order 62 sets of motors and 86 trucks, which it is hoped will be delivered within six months. The Committee have under consideration the extension of their railless system.

The Forest City Electric Services Supply Company, of Salford, have recently received orders for automatic point controllers from the Dublin United Tramways Company, Ltd., the Auckland Electric Tramways Company, and the Birmingham Corporation Tramways. Four machines are being supplied to the latter.

Glasgow Tramways Committee have recommended the acceptance of the following tenders:—Special D. C. C. wire, British Insulated and Helsby Cables, Ltd.; steel pinions for 49 B armatures, Alfred Wiseman, Ltd.; weldless car brake chains, Weldless Chains, Ltd.; V. I. R. cables, Liverpool Electric Cable Co., Ltd.; special bolts and nuts for rails, Ibbotson Brothers and Co., Ltd.

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PERSONAL.

Mr. J. H. Pillar has been elected chairman of the Plymouth Tramways Committee, and Mr. J. Moon has been re-elected vice-chairman.

Mr. H. K. Beale, solicitor, a member of the firm of Messrs. Beale and Company, has been appointed chairman of the Birmingham Electric Supply Committee.

Mr. A. Digby Willoughby has succeeded Colonel J. W. Walker as chairman of the Hull Tramways Committee. Mr. Richardson has been appointed deputy chairman.

Sir Harry Haward, Comptroller of the London County Council, and **Mr. A. L. C. Fell,** general manager of the tramways department, have been authorised by the Council to give evidence to the Departmental Committee on Silver Coinage.

Mr. J. B. Hamilton, general manager of Leeds City tramways, has been retained by the St. Anne's-on-Sea Urban Council to report upon the undertaking of the Blackpool, St. Anne's and Lytham Tramways Company, which is being purchased by the Council.

Mr. Howatt, power station superintendent at Southampton, has been promoted chief assistant to the electrical engineer at a salary of £420 a year. Mr. Hooper becomes power station superintendent at a salary of £300 a year.

Alderman T. Baker, late chairman of the Plymouth Tramways Committee, has been presented with the freedom of the borough enclosed in a silver casket, and Mrs. Baker has been presented with a silver rose bowl.

Mr. A. L. C. Fell, general manager of the tramways department, has been authorised by the London County Council to serve on the sub-committee appointed by the Advisory Committee on London Traffic to deal with the improvement of existing forms of street facilities.

At the meeting of the Stalybridge, Hyde, Mossley and Dukinfield Tramways and Electricity Board, **Alderman H. Sykes** was re-elected chairman for the ensuing year. In acknowledging his election, Alderman Sykes said he was anxious that the undertaking should be made a paying concern and that the annual precepts on the four Corporations should cease.

Mr. D. M. Watson, B.Sc., Assoc. M.Inst.C.E., has entered into partnership with Messrs. Dodd & Dodd, M.M.Inst.C.E., civil and consulting engineers, of County Chambers, Corporation Street, Birmingham. Mr. Watson has both American and English experience of professional work, while Messrs. Dodd & Dodd have had some 35 years of wide and varied experience in the design and construction of civil engineering work, both in England and abroad. The name of the new firm is Dodd, Dodd & Watson.

Mr. C. R. Everson, who recently retired from the position of general manager of the Plymouth Corporation tramways, at a meeting of the Town Council on November 17 was presented by Mr. J. Baker, on behalf of the subscribers, with an illuminated copy of the resolution passed at the previous Council meeting, referring appreciatively to his record as manager of the tramways for the past 26 years. Mr. Everson, in returning thanks, spoke of the growth of the undertaking during his managership. The new tramways manager, Mr. H. P. Stokes, was formally welcomed.

Councillor E. Haigh, a member of the Liverpool Tramways and Electricity Committee, who has just returned from a visit to New York, said he expected to find the American tramway systems would have many points of advantage compared with the Liverpool system, but speaking generally this was not so. He found that the private undertakings in New York were financially in a bad way. This is apparently due to the fact that passengers by the use of transfer tickets were allowed to travel over several routes for the payment of one fare.

The "Commonwealth Engineer" records the death, at Adelaide, of **Mr. S. E. Moulden,** chief assistant electrical engineer to the Adelaide Municipal Tramways Trust.

Utility of the Safety First Movement.—Mr. H. E. Blain, operating manager of the London Underground group, read an interesting paper on Saturday last at the Roads and Transport Congress at the Agricultural Hall on the "Safety First" movement. Mr. H. P. Bulnois presided, and introduced Mr. Blain as the founder of the movement in this country. Mr. Blain set forth a mass of evidence which proved indubitably the utility of the work that had been done, not only from a humanitarian but from a monetary point of view. Since the London Safety First Council was formed in 1916, there had, he said, been a steady decrease in the number of accidents and fatalities in the streets and on railways. The number of accidents in which the London General Omnibus Company were involved per 100,000 vehicle miles run had decreased from 22 in 1916 to 14 in 1918.

A Town Manager.—The New Plymouth (N. Z.) Borough Council has decided to appoint a general manager for the borough. The Council intends, says a *Times* message, to control the finances and to decide the policy like a board of directors, leaving the manager to administrate all the council's departments. This form of municipal administration is not unprecedented, as it is in force in some cities of the western part of the United States and Canada.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	Latest Return. 1919	Latest Return. Incr. or Dec.	Aggregate. Wks.	Aggregate. 1919.	Aggregate. Incr. or Dec.
Aberdare U.D.C. ..	Nov. 18	534	570	+ 36	33	18,202	+ 1,529
Aberdeen Corporation ..	,, 19	2,525	2,811	+ 286	34½	92,341	+ 17,343
Ayr Corporation ..	,, 22	372	449	+ 77	27	20,954	+ 4,206
Belfast City	,, 21	7,795	9,775	+ 1,980	34	350,302	+ 72,965
Birkenhead Corporation	,, 23	2,007	2,838	+ 831	33½	98,884	+ 24,092
Birmingham Corporation	,, 15	26,516	25,583	— 933	33	849,548	+ 68,261
do. Motor Buses	,, 15	1,483	1,537	+ 54	33	57,041	+ 7,969
Blackburn Corporation ..	,, 19	1,492	1,820	+ 328	34½	80,916	+ 16,896
Bradford Corporation ..	,, 22	8,419	10,596	+ 2,177	34	339,343	+ 73,029
Burnley Corporation ..	,, 22	2,065	2,830	+ 765	..	..	..
Burton-on-Trent Cor. ..	,, 23	357	508	+ 151	34	17,120	+ 3,178
Bury Corporation ..	,, 23	1,729	2,074	+ 345	33½	81,638	+ 11,173
Chatham & District ..	,, 13	971	1,187	+ 316	45	38,697	+ 2,799
Cork Electric	,, 13	503	647	+ 144	45	31,823	+ 3,608
Derby Corporation ..	,, 22	1,332	1,874	+ 542	34	66,112	+ 14,705
Dundee City	,, 19	1,759	2,305	+ 546	26½	69,177	+ 17,017
East Ham Corporation ..	,, 22	1,529	1,805	+ 276	32½	65,811	+ 13,695
Edinburgh	,, 15	8,541	8,998	+ 457	19½	223,047	+ 41,765
Glasgow Corporation ..	,, 22	26,492	30,057	+ 3,565	22	807,170	+ 90,320
Glossop (U.E. Sup. Co.) ..	,, 22	154	217	+ 54	47	10,501	+ 2,067
Huddersfield Corporation	,, 22	3,367	4,468	+ 1,100	34	166,778	+ 36,735
Ilford U.D. Council ..	22	868	1,060	+ 192	33½	40,783	+ 6,878
Ipswich Corporation ..	22	506	786	+ 280	34	32,186	+ 5,872
Isle of Thanet ..	,, 19	269	435	+ 166	7½	4,175	+ 1,912
Kilmarnock Corporation	,, 22	250	279	+ 29	27½	7,539	+ 725
Lanarkshire	,, 13	3,927	3,676	— 251	45	164,043	+ 3,793
Leeds City	,, 22	12,639	15,499	+ 2,860	34	564,751	+ 109,762
Leicester Corporation ..	,, 22	4,408	5,910	+ 1,502	..	..	..
Leyton U.D Council ..	,, 20	2,273	2,703	+ 430	34	106,430	+ 27,744
Liverpool Corporation ..	,, 22	18,449	23,108	+ 4,659	46½	1,011,845	+ 190,319
London County Council ..	,, 26	66,245	76,691	+ 10,356	34½	2,762,929	+ 518,732
Maidstone Corporation ..	,, 20	219	326	+ 107	33½	13,304	+ 3,625
Manchester Corporation	,, 22	24,630	28,749	+ 4,119	34	1,031,956	+ 153,961
Newcastle-on-Tyne Cor.	,, 15	6,738	8,399	+ 1,661	32	314,128	+ 14,606
Northampton Cor. ..	,, 21	801	1,253	+ 452	34	43,070	+ 13,839
Nottingham Corporation	,, 20	4,795	6,730	+ 1,935	34	242,748	+ 47,327
Oldham Corporation ..	,, 23	3,073	4,204	+ 1131	33	155,444	+ 33,412
Reading Corporation ..	,, 20	1,079	1,454	+ 375	34½	58,811	+ 9,685
Rotherham Corporation	,, 19	2,183	1,925	— 258	33½	79,458	— 8,092
Sheffield Corporation ..	,, 23	12,459	16,313	+ 3,854	34½	567,659	+ 101,289
Southampton Cor.	,, 19	2,322	2,191	— 131	33½	90,348	+ 3,851
,, Motor Buses	,, 19	..	137	..	16	2,039	..
Southend-on-Sea Cor. ..	,, 5	963	1,299	+ 336	32	74,252	+ 29,522
South Shields Cor. ..	,, 15	990	1,420	+ 430	33	47,313	+ 8,916
St. Helens Corporation ..	,, 18	..	1,293	..	7	11,211	..
Sunderland Corporation..	,, 23	2,024	2,648	+ 614	34	96,295	+ 25,278
Tyneside Trys. & Trmds.	,, 5	916	967	+ 51	19	23,895	+ 3,686
Wallasey Corporation ..	,, 22	1,517	2,050	+ 533	33½	87,363	+ 22,831
Walsall Corporation ..	,, 22	1,086	1,556	+ 470	34	50,040	+ 8,154
Walthamstow U.D. Coun.	,, 22	1,281	1,510	+ 229	34	59,071	+ 9,639
Warrington Corporation	Sept. 25	809	924	+ 115	25	22,663	+ 3,426
West Ham Corporation	Nov. 20	4,384	4,928	+ 544	32½	181,556	+ 28,765
Wolverhampton ..	,, 26	1,500	2,207	+ 707	34	60,594	+ 10,700

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	Latest Return. 1918-19	Aggregate. Wks.	Aggregate. 1918-19	Increase or Dec.
Anglo-Argentine ..	Nov. 25	£58,060	60,385	47	£2,768 691	+ £145,784
Ballarat and Bendigo(4 wks)	Sept 14	3,430	3,396	24	19,337	— 444
Brazilian Traction (Mrs.)	Sept.	9,081,000	1,792,000	39	83,559,000	+ 5,929,000
Brisbane	Sept.	35,400	44,970	39	346,370	+ 20,516
British Columbia .. $	Sept.	575,476	684,946	13	1,994,206	+ 460,423
Buenos Aires Lacroze	Oct.	41,643	49,692	17	187,070	+ 21,258
Burmah Tram. & Light Rs.	Oct.	34,848	51,898	13	138,733	+ 31,193
Calcutta .. .. Rs.	Nov 15	76,139	89,900	45½	..	+ 525,337
Carthagena and Herrerias	Oct,	2,525	1,465	39	26,989	— 13,957
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	Oct.	2,044	2,855	13	8,447	+ 2,4894
Hong Kong .. .. $	Oct. 11	14,244	15,899	41	604 04	+ 38,474
Kalgoorlie	July	2,798	2,815	30	18,657	— 136
La Plata	Sept.	4,999	5,540	39	51,044	+ 4,724
Lima	Sept	42,832	48,780	39	429,645	+ 39,887
Lisbon .. .. Escu	Mar.	238,290	276,625	..	..	..
Madras (2 weeks) .. Rs	Oct. 31	39,598	46,552	42	838.454	+ 40,968
Manila .. .. $	Sept.	204,500	223,048	39	1,833,199	+ 181,918
Montevideo ..	Sept.	29,611	35,552	47	404,501	+ 57 428
Pernambuco	Nov 22	4,726	7,225	46½	250,497	+ 16.213
Para	Oct.	22,442	27,949	47	273,961	+ 9,371
Peruvian .. .. $	July	287,300	1,058,730	..	..	..
Rangoon	Sept.	6,067	5.812	39	58,472	+ 2,892
Shanghai (2 weeks) $	Apr 23	50,760	56,755	16	447,279	+ 53,577
Singapore .. .. $	Nov. 18	13,161	17,317	42	647,123	+ 63,413
Toronto .. .. $	Aug	1,119,925	1,124,159	39	9,318,458	— 278,139
Winnipeg .. .. $	Aug.	285,670	381,248	39	2,947,060	+ 272 623

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THE
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SATURDAY, DECEMBER 6, 1919.

THE REVIVAL OF TRAMWAY ENTERPRISE.

During the war the promotion of Bills for electric tramway construction had necessarily to be suspended, and there were some persons who vainly imagined that the day of the tramway was over. The wish was no doubt father to the thought; for those who are ardent partisans of another form of traction of greater freedom and less responsibility appear to be as eagerly solicitous to contemn the tramway as to promote the interests of the motor omnibus. As there is plenty of scope for both, there seems no cause for internecine warfare; helpful co-operation is much the wiser policy from all points of view. In any case, the electric tramway is about to enter upon a new period of development and popularity, and there will be more tramway business for years to come than there has been for a long time. Of the many schemes under consideration, there are in England and Wales no less than twenty-eight definite tramway undertakings for which powers are to be sought in the next session of Parliament. Notices were given at the end of November of Private Bills in each of these cases, and in addition powers are being sought for three provisional orders and seven light railway orders, while four electric railway bills have also been notified. Of the tramway bills, twenty-two are sought by corporations or other local authorities, and these include several very important and extensive projects. The chief is, of course, that of the London County Council, which proposes to construct over 38 miles of track. Its plans will be vigorously opposed, as, indeed have all important schemes for tramway extension in the metropolitan area; and it is probable that some of the lines that the County Council consider necessary will be rejected. That has been the fate of many other excellent plans. The tramway on the Thames Embankment, to which no one now raises any objection, was many times rejected by Parliament, and the day may come when the necessary and harmless, if plebeian, tramway car will ply between Hyde Park Corner and the Marble Arch. The public must be served, and in no way can they be so efficiently provided with transport as by the electric tramway. The schemes of many of the provincial corporations will have an easier contest to face, and in most cases it is safe to say they will come successfully through the Westminster ordeal. It is gratifying to note that a number of corporations are applying not only for power to extend their tramways but to run motor omnibuses. In some cases they propose to run these vehicles beyond their own boundaries. There is no better way of dealing with the incipient traffic of districts in which population is growing. When the traffic reaches a point where tramway traction becomes more economical, the question of the substitution can be considered, when a convenient time arrives. In any case, it is on all counts desirable that local authorities running tramways should possess the power to work omnibuses, and possessing such power there is little doubt that much business will come from these authorities to the makers of motor vehicles.

INSTITUTE OF TRANSPORT.

PRESIDENT AND COUNCIL.

The preliminary arrangements in connection with the formation of the Institute are now well advanced, and it is hoped to have ready, in the course of a week or ten days, application forms for membership, so as to commence the active work of the Institute early in the New Year.

The Rt. Hon. Sir Eric Geddes, G.B.E., K.C.B., M.P., Minister of Transport, has accepted the position of first President of the Institute, and the first Council has been elected as follows :—

Messrs. J. Allen (Oxford), J. Bagwell (Dublin), H. E. Blain (London), Sir Alfred Booth (Liverpool), Sir Joseph Broodbank (London), Sir A. Kaye Butterworth (York), H. P. Currie (Newcastle-on-Tyne), Sir Francis Dent (London), C. A. Dutfield (London), Sir J. Eaglesome, K.C.M.G. (Leeds), Sir Sam Fay (London), Sir Maurice Fitzmaurice (London), S. E. Garcke (London), H. H. Gordon, L.C.C. (London), J. B. Hamilton (Leeds), R. J. Howley (London), Sir Wm. Joynson-Hicks, Bart., M.P. (London), Sir Lynden Macassey (London), D. A. Matheson (Glasgow), J. M. McElroy (Manchester) General Sir Henry Maybury (London), J. C. Mead (London), General Sir Philip Nash (London), Sir Julian Orde (London), Sidney Preston (London), Sir Wm. Raeburn, M.P. (Dumbarton, N.B.), Sir Alfred Read (London), G. Renwick, M.P. (Newcastle Central), Hon. Sir Arthur Stanley, G.B.E. (London), E. S. Shrapnell-Smith (London), F. Tatlow (Derby), J. Willmott (Warwick), and W. Wolsey, Jun. (London)..

Temporary office accommodation has been taken, and will be in use towards the end of next week, at 2 and 3, The Sanctuary, Westminster, two doors from Westminster Abbey (Telephone No. Victoria 422) and, pending the appointment of a permanent Secretary, Mr. H. E. Blain is acting as Hon. Secretary to the Council.

INCREASES IN FARES.

At a meeting of the Newcastle Tramways Committee on November 28, Mr. Richard Mayne presiding, the consideration of the question of fare revision and more car accommodation was deferred until a report could be prepared by the Traffic Sub-Committee and presented at the next meeting.

Bury Town Council on December 1 approved the scheme submitted by the Tramways Committee for a revision of fares and stages on the Corporation tramway system. The 1d. fares will be abolished and the minimum fare will be 1½d. Most of the through rates will also be increased by ½d. From Bury to Manchester the fare, which before the war was 5½d., will now be 8d., while the rate to Bolton is increased from 4d. to 5d.

At a meeting of the Finance Sub-Committee of the Glasgow Tramways Committee on November 26, after a discussion lasting an hour and a half, it was decided to recommend that the existing fares should be increased. A proposal to add a halfpenny to each fare, including the existing halfpenny fares, was approved. Mr. James Dalrymple, general manager, submitted a statement showing an estimated deficit of £19,435 on the working of the tramways for the first quarter of the financial year (June 1 to August 31). When the recommendation was submitted to the Tramways Committee on December 3, Councillor Kelly presiding, an amendment was carried by 19 votes to 9, providing that no change should be made in the fares during the present financial year which ends on May 31, 1920.

Portsmouth Tramways Committee have decided to rescind their resolution to increase all fares by 50 per cent. It is now proposed instead to shorten the sections. The basis of the revision will be a penny a mile.

MOTORS AND RAILWAY WAGONS IN FRANCE.

In the House of Commons on December 2 Mr. Churchill stated that 2,252 lorries were still in use between the Channel and Cologne. Reductions would be made as rapidly as the needs of the service permit. Up to the present the Army had been able to dispense with lorries more rapidly than they could be shipped to this country. There were at present in France nearly 18,200 railway wagons lent to the War Department by British railway companies, and about 4,700 wagons belonging to the Department, all of which are being returned for use in this country. The total number of wagons railway owned and Department owned, which have been returned since the armistice, is 11,677.

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NEW LONDON GOODS SCHEME.

AN ORGANISED SERVICE OF MOTOR VEHICLES.

Under a scheme of the Railway Executive Committee, which to some extent is an alternative to the proposed Gattie "clearing house," a London area from Hammersmith on the west to the docks on the east, and from Highgate on the north to Herne Hill on the south, will be divided into nine districts for cartage purposes. All merchandise will be divided into two classes—full loads for one or two traders only, and miscellaneous merchandise requiring sorting.

Full wagon loads will be sent by rail to the depot nearest to the point of delivery, while miscellaneous merchandise will be sent to the company's main stations. There are to be 26 distributing centres, each serving its own zone, which as far as possible will have the same boundaries as the new postal districts. The zones will be sub-divided into sections, each to be served by the same carman as far as it is possible. Fast motor vehicles run on a fixed time table are to handle traffic between the main stations and the distributing centres. The scheme will operate towards keeping miscellaneous slow-moving traffic off the streets by inducing the small trader to send his consignments from one area of London to another through the railway companies' organisation, instead of using his own cart.

L.C.C. TRAMWAY MATTERS.

At the meeting of the London County Council on Tuesday the following business was transacted:—

CHARGES FOR STREET IMPROVEMENTS.—The recommendations of the Highways Committee, the consideration of which had been postponed at previous meetings, with regard to the removal of certain financial burdens on the tramways, including the cost of street improvements along tramway routes, were considered. It was recommended that no part of the cost of street improvements be charged to the tramway account except in the case of improvements that were solely and specifically required for the working of the tramway system.

A Joint Committee of the Finance, Highways and Improvements Committees recorded that "no change be made in the principle, consistently followed by the Council since it began to operate tramways, of allocating to the account of the tramways a sum in respect of the cost of street widening in cases in which the widenings are partly or entirely necessitated by tramway construction."

Sir John Benn moved an amendment, "That having regard to the opinion expressed by the Council that inequitable differentiation in treatment exists between the Council's tramways and other competitive forms of traction, and further, having regard to the fact that the Council is the statutory authority for carrying out street improvements for meeting the demands of all kinds of traffic, the Council is not prepared to continue any longer to impose charges upon its own tramways while effecting improvements for competing traffic free of all cost."

Mr. Gordon seconded, but Mr. R. C. Norman said the sinking fund and interest for improvements amounted to only a small sum comparatively of £30,000 on the tramways account last year, whereas two awards made with respect to tramway workers' wages had added a sum of no less than £400,000 to expenditure.

The amendment was rejected by 61 votes to 47 and the Committee's recommendation was approved. The adjourned report of the Highways Committee on the same subject consequently dropped.

ROAD LOCOMOTIVES AND HEAVY MOTORS.—The General Purposes Committee submitted a long report on that of the Departmental Committee appointed by the President of the Local Government Board on Road Locomotives and Heavy Motor Cars, and submitted a precis of the report with the observations of the Finance, Highways, Local Government, and Public Control Committees thereon. The General Purposes Committee recommends, inter alia, that provision should be made for the payment of compensation to road and tramway authorities for damage caused by these vehicles. The Public Control Committee were of opinion that special attention should be paid, in any contemplated amendment of the law, to the loss of life in street accidents, which, it is claimed, could have been avoided had the motor vehicles concerned been equipped with lifeguards.

Rev. J. Scott Lidgett moved an amendment excluding roads specifically prepared and reserved for all classes of traffic, contending that the main arteries of traffic in town and country should be constructed to bear the heaviest weight, and the remaining roads should be preserved and protected from the unusual wear and tear of heavy vehicles.

Mr. H. H. Gordon seconded, but the amendment was rejected by 59 votes to 48.

NEW OMNIBUS ROUTES.—On the same report, the General Purposes Committee also recommended that the proposal that no new motor omnibus routes should be instituted without the consent of the road authority, should not apply to omnibus services run under a statutory authority. Mr. D. Hazel moved to add the following: "in the County of London, which shall be subject to the Authority set up to control London traffic." After a lively debate, Mr. J. W. Gilbert, chairman of the Committee, took the recommendation back for further consideration.

TRAMWAY JUNCTION LINES.—On February 4 last, the Council approved a proposal for junction lines between Stockwell Road and Clapham Road, and Tooting High Street and Mitcham Road. At that time the sanction of the Treasury was required for expenditure on capital account and in order to save time the cost of the special work, etc., was charged temporarily to maintenance account. The sanction of the Treasury not now being required, it was proposed to transfer the cost to capital account. In addition to the special work, amounting to £6,945, an expenditure of £480 is necessary for rails and fastenings, and £2,400 for labour in connection with the installation of the junctions, and £1,900 for stores and materials. The Council approved of the estimate of £11,725 on capital account.

OPPOSITION TO THE TRAMWAYS BILL.—Mr. W. C. Johnson asked how many of the 16 new tramways decided upon last month and what mileage had been vetoed by the city and borough councils; what number and mileage was Parliament being permitted to consider?

Col. H. H. Tasker replied: (1) Tramway No. 5—which was wholly in the City of Westminster had been vetoed by Westminster Council; all the other tramways were in more than one city or borough. In the case of 8 tramways, refusals had been received in respect of parts of the proposed line; in respect to other parts, replies had not yet been received. In the case of two tramways, St. Pancras had agreed to the portions of the lines within their area, but in respect to other portions no replies had reached the Council. In the case of 5 tramways, no replies had been received. (2) Mileage figures for the separate boroughs were not available.

TRACK REPAIRS.—Mr. J. D. Gilbert, M.P. asked (1) What were the orders of the Highways Committee as regards the repair of tramway roads and crossovers at important traffic points; (2) Could the repairs being done at the Elephant and Castle be carried out entirely at night so as to stop delay to traffic?

Lt.-Col. A. C. H. Kennard said that the Committee had issued no instructions as to the manner in which the repairs were to be carried out. The work was left to the discretion of the officers. Work was done at night in a number of cases. (2) Day and night gangs were renewing the crossings at the Elephant and Castle. There would be no relief to traffic by the working only at night, as in any case the roadway would be in an unfinished condition and fenced off.

MISCELLANEOUS NEWS AND NOTES.

Free Passes for Disabled Men.—Free passes are to be given to disabled men at Aberdeen.

Women Replaced by Men on Aberdeen Tramways.—All women employees have now been dispensed with on the Aberdeen tramways' their places having been filled by men.

Berlin Transport Workers Abandon Strikes.—The *Times* recently reported that municipal tramway employees of Greater Berlin had decided to withdraw from the Union of Transport Workers, as they were unwilling to take part in hopeless strikes.

Railless Cars for Bradford.—Mr. R. H. Wilkinson, general manager of Bradford Corporation tramways, has designed a type of railless vehicle which will be larger than those now in use at Bradford. The new vehicle will seat fifty people, and will have a smoking compartment. The plans have yet to be approved by the authorities.

Vestibules Advocated at Preston.—Preston Corporation have decided to purchase from Sheffield Corporation six single deck cars at a cost of £350 each. The general manager has been directed to submit an estimate of the cost of putting vestibule fronts on all the Corporation cars.

Railway Electrification.—During the discussion on the Electricity Supply Bill, Sir Eric Geddes, Minister of Transport, mentioned that plans for electrification were being considered by the Midland, the Great Eastern, the South Eastern and the London, Brighton and South Coast Railway Companies.

New Cars at Bradford.—Eight new cars have recently been put in service on the Bradford Corporation tramways. It is stated that the manufacturers could not have delivered the cars if the Corporation tramways department had not been able to supply them with sets of wheels. The Corporation has a good stock of such parts, and will be able to assist the makers with other sets.

Question of Promotion from the Ranks.—Northampton Tramways Committee, after rescinding at the dictation of the tramway employees the appointment of traffic superintendent, have arranged for a small sub-committee to go into the whole question of the future appointment of inspectors. The employees contend that when vacancies occur they should be filled by promotion from the ranks, and object to an outsider being brought in.

Purchase of Potteries Tramways Abandoned.—The special Tramways Committee of the Stoke-on-Trent Council have decided to recommend the Council to abandon the proposed purchase of the undertaking of the Potteries Electric Traction Company, Ltd., and to promote a Bill in Parliament for power to purchase and run motor omnibuses in the six federated towns of the Potteries and the adjacent districts.

Rolling Stock Question in Edinburgh.—Edinburgh Tramways Committee has remitted to a sub-committee to consider, in conjunction with the tramways manager and the engineer, the question of ordering additional cable cars to cope with the increasing traffic. The carrying capacity of the cable is, however, a question that will have to be considered. The Committee will recommend the purchase of ten new top covers for existing cars in addition to the forty at present on order. In order to utilise in regular service the chars-a-bancs in use for passenger pleasure traffic, it was decided to recommend the purchase of omnibus bodies, which would be removable in the summer.

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New Omnibuses at Edinburgh.—One of the twelve Leyland omnibuses recently ordered by the Edinburgh Corporation Tramways Committee has been delivered and is locally described as admirably suited to its purpose. It is constructed with a door at each end, thus enabling passengers to enter or leave with a minimum of inconvenience.

Basingstoke and Alton Light Railway.—Meetings have been held in support of the movement to secure the re-opening of the Basingstoke and Alton Light Railway, and a representative deputation from the district has been appointed to wait upon the Ministry of Transport to point out the importance to the locality of the re-institution of the services.

Motor Omnibuses at Brighton.—Brighton Corporation propose to grant to Tillings, Ltd., power to run motor omnibuses for a period of seven years in return for a wayleave in the borough of about £2,000 per annum. The same rate will be paid to Hove Town Council. The fares to be charged will be subject to the approval of the local authorities.

Barrow Corporation Purchases its Tramways.—Barrow Town Council have purchased for £96,250 the tramways hitherto owned and operated by the British Electric Traction Company. The Corporation will take over the control on January 1, 1920. Mr. J. R. Groves, the present manager of the tramways, will become manager under the Corporation at a salary of £600 a year.

Brighton Extensions.- Brighton Council have approved the application to the Light Railway Commissioners authorising the Corporation to construct and work a light railway as an extension of the tramways from the present terminus in Lewes Road to a point on land adjoining the south-eastern side of the road, approximately opposite to the lodge gates of Moulscombe Place.

Cheap Tickets for School Children.—Nottingham Tramways Committee, by an arrangement with the Education Committee, are supplying prepaid cheap tickets for secondary school children living in outlying districts. The tickets are delivered to the Education department as required and distributed to the head masters, to whom applications for tickets are made.

Danger of Defective Eyesight.—The Ministry of Transport have drawn attention of tramway authorities to the fact that at an inquest in the case of a woman who was fatally injured in attempting to board a tramway car, the conductor of the car had lost the sight of an eye on military service, and they point out that in the interests of public safety men suffering to any serious extent from defective eyesight should not be employed as tramcar drivers or conductors.

Suspension of Christmas Day Traffic.—Maidstone Light Railways Committee have recommended that the tramway service should be suspended on Christmas Day, and that the employees should receive a day's pay. Alderman Lyle said that last year when the service was suspended on Christmas Day they did not receive a single complaint from the public. Gloucester Light Railways Committee have also decided to suspend the services on Christmas Day.

No Christmas Day Service at Belfast.—At a meeting of the Belfast Tramways and Electricity Committee a letter was received from the National Amalgamated Union of Labour intimating that a ballot had been taken by the motormen and conductors on the question of taking a holiday on Christmas Day, with the result that 644 voted in favour of the proposal and 24 against it. The Committee decided to refer to the Council the proposal that the services should be entirely suspended on Christmas Day as was the case last year.

Chars-a-bancs Owner's Proposal.—The Bradford *Argus* states that an interesting offer was recently made to the Tramways Committee by a local chars-a-bancs proprietor, who asked if he could be permitted to run one of his vehicles for passenger service on the Duckworth Lane route. The proprietor's argument was that the service needed supplementing. The Tramways Committee discussed the matter at length, but rejected it on the ground of the increasing congestion of traffic.

South Western New Goods Depot.—In order to relieve the congestion at Nine Elms goods depot, the London and South Western Railway Co. are building a new depot for goods at Feltham, Middlesex. The scheme will also relieve the main line between Weybridge and Clapham Junction of goods traffic, and lessen the cost of carriage of goods from Southampton and the West. The yard will be thirty acres in area and a mile long. By the use of humps the shunting will be done by gravitation. The scheme will cost £250,000 and will be completed in the summer of 1921. About 170 cottages are being erected in the form of a garden suburb to accommodate the staff. The district is served by the London United Tramways.

A Midland Power Scheme.—In the House of Commons on December 2, Mr. Sitch asked the Home Secretary if it was proposed to issue Government sanction for the erection in the Midlands, at an estimated cost of £14,000,000, of a great electric power station, designed to serve the counties of Stafford, Leicester, Nottingham, and Derby; whether such undertaking would be in any sense under direct public ownership and control; and whether before any sanction was given to the proposal he would publish the terms on which such sanction would be based. MR. BRIDGEMAN (Parliamentary Secretary to the Board of Trade), who replied, said:—I understand that the question of reorganising the supply of electricity in this district has been under consideration by the interests concerned, but no application for Government sanction in any form has been made. The promotion of any scheme that may be proceeded with will be subject to the provisions of the Electricity (Supply) Bill, if passed, which include full provisions for inquiry and publication.

Liverpool Experiments with the Queue System.—Liverpool Tramways Committee propose to adopt the queue system. At the last meeting of the Committee, on the motion of Councillor David Jackson, it was resolved to ask the Watch Committee to authorise the head constable to make arrangements in conjunction with the general manager for the initiation as an experiment of the queue system for passengers at the Old Haymarket. If the experiment proves successful, it is probable that queues will be arranged elsewhere.

Opposition to London Tramway Extensions.—The Corporation of the City of London has decided to inform the London County Council that it cannot assent to the proposed tramway extensions in the City. Westminster Council has also refused to approve the plans of the Council. Mr. J. Abady said that the scheme was ambitious, but inexpedient and ill-advised. Sir H. Jessel described the proposal as "maniacal." Councillor Gattie supported the proposal, as the congestion at certain points was terrific. At Victoria, it would be possible, he said, with better facilities to deal with the passengers in half the time occupied at present.

Who are Workmen.—A representative meeting of clerical staffs and non-manual workers in a Welsh town recently resolved to take action with a view to remove the hardship imposed on those classes by the recent order respecting workmen's fares. By the order, passengers who could not claim to be manual workers are not allowed the privilege of workmen's fares. This has resulted in hundreds of clerical workers with small salaries having to pay about three times as much for long distance journeys as artisans in receipt of much higher wages. The meeting resolved to approach the Tramways Committee and press for the removal of what is regarded as unfair restriction.

Standard Tramway Gauge Wanted.—A correspondent of the "Yorkshire Observer" makes the suggestion that, as the great majority of the West Riding boroughs are thinking of extending their boundaries, and there are proposals for a further linking up of the districts by tramways, some authority to investigate thoroughly the whole system of communications throughout the West Riding should be set up. Halifax and Huddersfield are both proposing to develop their systems in the near future, and while their efforts are to be commended the results will not be very satisfactory unless some scheme involving greater co-ordination is arranged. When direct tramway communication is provided between Huddersfield and Bradford it will be inconvenient to run through cars because the gauges are different. At Huddersfield the guage is 4 ft. 7¾ in., at Halifax, 3 ft. 6 in., at Bradford, 4 ft., and at Leeds, 4 ft. 8½ in. Through traffic under these conditions is out of the question.

Farewell to Southampton Women Employees.—The women employed on the Southampton Corporation tramways were the guests of the Committee at a farewell gathering recently. Upwards of two hundred employees attended, and the chairman of the Tramways Committee, Alderman Dunsford, and other members were present. The Chairman said that they met at the close of a period of intense anxiety to all those concerned with the administration of tramway work. In 1914 when the war came upon them they suffered very severely as an undertaking by the loss of some of their best men, who were called up to defend their country. At one time it looked as though the service would have to be severely curtailed, but with the assistance of the ladies who offered their services they had done remarkably well. Altogether 280 women passed through the department and there were some who had remained in the service to the last. The Committee had always felt and expressed their appreciation of the work of the staff right through, and as a final token they asked each employee to accept a handsome souvenir.

PERSONAL.

Mr. W. G. Marks, traffic superintendent of Rotherham Corporation tramways, has been granted an increase in salary to £300 a year.

Mr. E. H. Bond, general manager of Dover Corporation tramways, has been granted a war bonus of £50 per annum.

Alderman E. Russell Taylor proposes to tender his resignation as chairman of Liverpool Tramways Committee owing to increase of business engagements, which prevent him from giving the time which he has hitherto devoted to the work of the Committee.

At the anniversary dinner of the St. Andrew's Society of Glasgow held on Monday evening, the Earl of Cassilis presiding, **Mr. James Dalrymple, J.P.,** general manager of the Glasgow Corporation tramways, who is president of the Glasgow branch of the Society, was presented with his portrait in oils painted by Mr. J. Raeburn Middleton. The painting was formally unveiled by the Earl of Cassilis, who warmly eulogised Mr. Dalrymple's many public services and assured him of the cordial felicitations of the Society.

Mr. David James, who has long been well known in the tramway industry as general manager of the Swansea Improvements and Tramways Company, has been appointed a magistrate. He entered the service of the Swansea Tramways Company as an office boy over forty years ago, and was successively promoted to the positions of junior clerk and chief clerk, and in 1899 he was appointed general manager. He is also managing director of the South Wales Transport Company. During the war he was a member of the Glamorgan Appeal Tribunal, and was on the Swansea Intermediary Board of the Appointments Department of the Ministry of Labour. He was also a member of the Court of Referees (Unemployment Department).

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FINANCIAL.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended December 3rd amounted to £74,702, an increase of £7,032 as compared with the corresponding period last year. The route mileage was 141.67 the same as a year ago. From April 1st (the commencement of the financial year) to December 3rd (thirty-five weeks and two days) the total receipts were £2,837,573, an increase of £520,755 on the corresponding period of 1918.

Ipswich Corporation Tramways.—The annual report of Mr. Frank Ayton, chief engineer and manager of the electric supply and tramways department of Ipswich Corporation, contains the usual statement of results. For the year, ended March 25, 1919, the income was as follows:—Revenue, £38,775; contribution from the rates to renewals fund, £3,422; bank interest, £25, making a total of £42,222. The working expenses were £30,279, including war service allowances of £578. Capital charges, including interest and repayment of loans, amounted to £5,648, while a sum of £3,422 was paid to the fund for the renewal of permanent way, making a total expenditure of £39,349. The total working expenses showed an increase of £3,208, or 11.85 per cent. Wages to motormen and conductors are £1,615 higher, or 18 per cent. Although the car mileage was less than in the previous year, by 154,831 miles (24.2 per cent.), the number of passengers carried increased by 154,831, or 2.55 per cent. The total car mileage amounted to 473,893, and the passengers carried to 6,224,608. Energy per car mile consumption averaged 1.151 units. The total revenue per car mile was 19.637d., and the percentage of working expenses was 78.09. The Corporation now operates about 11 miles of track and has 36 cars.

CONTRACTS AND ORDERS.

Aberdeen Corporation propose to purchase a new overhead tower wagon at a cost of £1,200.

Portsmouth Corporation have received tenders for tramway rails, the lowest tender, that from an American company, being £5,000 less than any tender submitted by a British manufacturer.

Glasgow Numerical Ticket Printing Company, Ltd. are the successful tenderers for the tickets for Aberdeen Corporation tramways.

St. Helens Corporation have placed an order for a turbo-alternator and condensing plant with Machinenfabrik Ateliers de Construction Oerlikon, Switzerland. The condensing plant will be made by Messrs. Hicks, Hargreaves and Company, of Bolton, and the economisers will be supplied by Messrs. E. Green and Son, Ltd., of Wakefield.

Edinburgh Corporation recently placed an order for large turbo-alternator plant with Brown, Boveri and Company, Ltd., of Baden, whose tender was much the lowest. Other firms that tendered were as follows: Oerlikon, Vevey, Switzerland; Escher, Wyss and Co.; Zurich, Switzerland; J. Howden and Co.; Daniel Adamson Co.; Richardsons, Westgarth and Co., Ltd.; Fraser and Chalmers, Ltd.; British Thomson-Houston Co., Ltd.; Parsons and Co.; Belliss and Morcom, Ltd. (Vickers alternators); English Electric Co., Ltd.; Belliss and Morcom, Ltd. (G.E.C. alternator); British Westinghouse Co. Ltd.

Sandberg's "Insitu" Rail Hardening Process.—The Bristol Tramway Company and Bournemouth Corporation have each placed orders with Scholey and Company, Ltd., 56, Victoria Street, London, S.W.1 for the treatment of two miles of track by the Sandberg "insitu" process, the latter being a repeat order. This process for increasing the durability of existing tramway rails has made rapid progress during the past nine months, and that it has passed the trial stage is evinced by the number of repeat orders placed. Messrs. Scholey and Company, as licencees and contractors, have secured contracts during this period for the treatment of close upon forty miles of track on the principal tramway systems.

Ministry of Transport and Mr. Merz.—Sir E. Geddes, replying in the House of Commons to Sir F. Hall, stated that Mr. C. H. Merz is not employed in any capacity by the Ministry of Transport. It never had been the intention to employ him in the administration of the Electricity Supply Bill, the Chief Commissioner Designate being Sir John Snell. He (Sir E. Geddes) had, however, asked Mr. Merz, whose knowledge of the application of electricity to traction is unrivalled, whether in certain circumstances he would assist the Ministry of Transport in questions of electric traction. As Mr. Merz was now in Australia the matter could not at present be carried further.

POSITIONS VACANT.

ROCHDALE CORPORATION TRAMWAYS.

Appointment of Traffic and Ticket Inspectors.

Applications are invited to fill vacancies for Traffic and Ticket Inspectors for the above tramway system.

Only live men with the necessary qualifications will be considered. Applications must be made in own handwriting, stating age and experience, with copies of testimonials to

GEO. WEBSTER,
General Manager, Tramway Offices,
Mellor Street, Rochdale.

Tramway Offices, Rochdale.
4th Dceember, 1919.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	Nov. 25	499	597	+ 98	34	18,799	+ 1,629
Aberdeen Corporation	,, 26	2,392	3,034	+ 642	25½	95,375	+ 17,985
Ayr Corporation	,, 28	382	432	+ 50	28	21,387	+ 4,258
Belfast City	,, 28	8,115	10,126	+ 2,011	35	360 428	+ 75,976
Birkenhead Corporation	,, 30	2,140	2,825	+ 685	34½	101,710	+ 24,597
Birmingham Corporation	,, 22	22,221	25,938	+ 3,717	34	875,481	+ 71 978
do. Motor Buses	,, 25	1,221	1,582	+ 371	34	59,323	+ 8,330
Blackburn Corporation	,, 23	1,488	1,913	+ 425	37½	31,929	+ 17,336
Bradford Corporation	,, 28	8,529	10,785	+ 2,256	35	400,128	+ 75,285
Burnley Corporation	,, 29	2,115	2,817	+ 702	..	..	..
Burton-on-Trent Cor.	,, 30	391	472	+ 81	35	17,592	+ 3,259
Bury Corporation	,, 30	1,793	2,105	+ 312	34½	83,743	+ 11 458
Chatham & District	,, 20	1,032	1,301	+ 269	46	69,998	+ 10,068
Cork Electric	,, 20	480	685	+ 205	46	32,508	+ 8,813
Derby Corporation	,, 29	1,361	1,854	+ 493	35	67,867	+ 15,199
Dundee City	,, 26	1,800	2,439	+ 639	27½	71,616	+ 17,656
East Ham Corporation	,, 29	1,580	1,853	+ 343	33½	67,464	+ 13,438
Edinburgh	,, 22	8,122	9,403	+ 1,281	20½	282,450	+ 43,046
Glasgow Corporation	,, 29	27,627	31,909	+ 4,282	26	839 079	+ 94,570
Glossop (U.E. Sup. Co.)	,, 29	174	220	+ 46	48	10,722	+ 2,114
Huddersfield Corporation	,, 29	3,641	4,549	+ 908	35	171,327	+ 37,543
Ilford U.D. Council	,, 29	934	1,073	+ 139	34½	41,857	+ 7,030
Ipswich Corporation	,, 29	570	795	+ 225	35	33,015	+ 6,100
Isle of Thanet	,, 26	271	484	+ 213	8½	4,659	+ 2,125
Kilmarnock Corporation	,, 29	260	268	+ 8	25½	5,107	+ 733
Lanarkshire	,, 20	2,783	3,145	+ 362	46	171,188	+ 4,156
Leeds City	,, 29	13,121	15,760	+ 2,639	35	580,511	+ 112,614
Leicester Corporation	,, 9	4,601	5,813	+1,212	..	..	..
Leyton U.D Council	,, 27	2,290	2,727	+ 437	35	109,157	+ 28,151
Liverpool Corporation	,, 29	19.159	24,074	+ 4.915	47½	1,065,920	+ 195,285
London County Council	Dec. 3	67,670	74,702	+ 7,032	35½	2,837,573	+ 520,755
Maidstone Corporation	Nov. 27	226	346	+ 120	34½	13,650	+ 3,744
Manchester Corporation	,, 29	25,122	29,819	+ 4,697	35	1,064,745	+ 158,707
Newcastle-on-Tyne Cor.	,, 29	8,373	8,933	+ 560	34	331,768	+ 15,863
Northampton Cor.	,, 23	868	1,221	+ 353	35	44,291	+ 14,192
Nottingham Corporation	,, 27	4,934	6,989	+ 2,055	35	249,738	+ 49,383
Oldham Corporation	,, 30	3,121	4,220	+ 1,099	34	159,634	+ 34,512
Reading Corporation	,, 27	1,137	1,438	+ 301	35½	55,249	+ 9,987
Rotherham Corporation	,, 26	2,125	2,086	— 139	34½	72,544	— 8,182
Sheffield Corporation	,, 30	15,709	16,496	+ 3,787	35½	584,156	+ 105,077
Southampton Cor.	,, 26	2,347	2,878	+ 531	34½	93,227	+ 4,382
,, Motor Buses	,, 26	..	163	..	17	2,233	..
Southend-on-Sea Cor.	,, 26	1,033	1,338	+ 305	35	78 294	+ 30,308
South Shields Cor.	,, 15	990	1,420	+ 430	33	47,313	+ 8,916
St. Helens Corporation	,, 25	..	1,519	..	8	12,730	..
Sunderland Corporation	,, 30	2,083	2,615	+ 527	35	100,910	+ 25,804
Tyneside Trys. & Trmwys.	,, 19	863	903	+ 40	21	25,746	+ 4,098
Wallasey Corporation	,, 29	1,581	2,135	+ 554	34½	69,493	+ 23,386
Walsall Corporation	,, 29	1,152	1,553	+ 401	35	51,594	+ 8,555
Walthamstow U.D. Coun.	,, 29	1,297	1,516	+ 219	35	60,587	+ 9,872
Warrington Corporation	,, 20	786	897	111	34	29,911	+ 4,280
West Ham Corporation	,, 27	4,525	5,054	+ 529	34½	186,610	+ 29,293
Wolverhampton	Dec. 3	1,593	2,146	+ 553	35	71,739	+ 11,252

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Wks.	Aggregate. 1918-19	Increase or Dec.
Anglo-Argentine	Dec. 22	£59,964	63,539	48	£2,837,230	+ £154,359
Ballarat and Bendigo(4 wks)	Sept 14	3,430	3,396	24	19,337	— 444
Brazilian Traction (Mirs.)	Sept.	9,081,000	9,792,000	39	83,559,000	+ 5,829,000
Brisbane	Sept.	35,400	41,970	39	346,370	+ 20,516
British Columbia $	Sept.	575,476	684,946	13	1,994,206	+ 460,423
Buenos Aires Lacroze	Oct.	41,643	49,692	17	187,070	+ 21,258
Burmah Tram. & Light Rs.	Oct.	34,848	51,898	13	138,733	+ 31,194
Calcutta Rs.	Nov 22	82,201	90,980	45½	..	+ 534,116
Carthagena and Herrerias	Nov.	2,988	2,519	44	29,518	— 14,306
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	Oct.	2,044	2,855	13	8,447	+ 24,894
Hong Kong $	Oct. 11	14,244	15,899	41	604,803	+ 38,474
Kalgoorlie	July	2,798	2,815	30	18,657	— 126
La Plata	Sept.	4.999	5,540	39	51,043	+ 4,728
Lima	Sept	42,838	48,780	39	429,615	+ 39,887
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Oct. 31	39,598	46,553	42	838,454	+ 40,988
Manila $	Sept.	204,500	223,048	39	1,833,199	+ 181,918
Montevideo	Sept.	29,611	35,553	47	404,501	+ 57.428
Pernambuco	Nov 20	4,793	7,500	47½	258,297	+ 49.220
Para	Oct.	22,442	27,249	47	273,861	+ 9,871
Peruvian $	July	987,300	1,058,780	..	..	..
Rangoon	Sept.	6,067	5,812	39	58,472	+ 2,892
Shanghai (2 weeks) $	Apr. 23	50,760	56,755	16	447,279	+ 53,577
Singapore $	Nov. 18	14,161	17,317	42	647,123	+ 63,413
Toronto $	Aug	1,119,925	1,124,159	39	9,318,458	— 278,139
Winnipeg $	Aug.	285,670	381,248	39	2,947,060	+ 272 923

CARS, MOTORS, CONTROLLERS.

(DICK, KERR SYSTEM.)

THE
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THE
Tramway AND Railway World

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SATURDAY, DECEMBER 13, 1919.

TRANSPORT MINISTER AND ROAD TRAINS.

Although road and tramway authorities will closely watch the attitude of Sir E. Geddes concerning road trains, his views as at present developed afford no reason for alarm. In his address to the Society of Motor Manufacturers and Traders, the Minister of Transport revealed himself as anxious to encourage the development of motor traction. This attitude was especially notable in regard to the commercial vehicle, and the Minister suggested that with labour costs at so high a figure there is need for devising methods to enable heavier loads to be carried without great increase of cost. In exploring this subject he mentioned the road train, which is yet in its infancy. Evidently he had the tractor and several trailers in mind. That means of transport is not rare among contractors for road repairing and also among county authorities. In its original form of an engine with straked tires there could not be a machine more destructive of roads. Nowadays the tractor is rubber-shod, and even the wheels of trailers are being reconstructed to that end, thus securing greater speed combined with decreased cost of vehicle maintenance. When tractors and petrol lorries were steel-tired they were regarded as destructive of roads and of tramway tracks, but lately this criticism has not been heard. Moreover, road and tramway authorities are users of rubber-tired wagons and trailers. That circumstance must make them the more anxious to render the roads fit to take the traffic. Neither on the part of users nor of vehicle manufacturers does there appear to be any inclination to make use of two or more trailers. It is true that during the railway strike the demobilised army drivers were found driving in miniature convoy formation whenever opportunity offered. There were two reasons for that tendency. One was the force of habit on the western front ; the other was that it would enable them more easily to meet opposition. Because Sir E. Geddes, in his reference to road trains, recounted what had been accomplished by motor convoys in France, it is not to be implied that he favours the system here. For one thing it would be no more economical than the single vehicle, and would have the disadvantage of entailing extra road wear. He may have had in mind the coupled electrically driven vehicles introduced in Paris some time ago ; with such a train the running costs would probably be lower. There is undoubtedly an opening for motor vehicle makers to introduce improvement in the running of trailers. In that direction there should be scope for lessening the cost of haulage.

REPORT ON THE BURTON ACCIDENT.

Major G. L. Hall, R.E., has presented his report to the Public Safety and General Purposes Department, Ministry of Transport, on his inquiry into a tramway car accident at Bearwood Hill Road, Burton-on-Trent, on October 8. The car belonged to the Burton and Ashby Light Railway, and was at the time running on the Corporation system. When it had reached a point about two-thirds of the way up Bearwood Hill Road, the car began to run backwards, and was eventually derailed and overturned at the curve immediately at the foot of the incline. Five passengers and the conductress were very severely injured, and the driver and 11 other passengers were more or less hurt. In the case of one of the passengers and the conductress, the injuries proved fatal. The car was single truck, double-deck, with open top. Electrical equipment : 2 Westinghouse 40 h.p. motors, 2 Westinghouse No. 210 controllers, with alterations and additions. Brake equipment : Hand brake, fitted with double purchase gear, operating blocks on all four wheels, magnetic track brake, of the Westinghouse-Newell pattern, operating two pairs of track shoes between the wheels, and also blocks on the sides of the wheels opposite to the blocks operated by the hand brake ; run-back electric brake, so arranged that each motor is short-circuited when the controller handle is in the off position and the reversing handle is in the forward position, giving a short-circuit braking effect if the car runs backwards.

The Inspector says : After careful consideration of the evidence and of attendant circumstances, I come to the following general conclusions :

(a) The slipping of the wheels immediately prior to the run back was caused by the exceptionally bad condition of the rails at this point, and resulted in the run back from the fact that Charles Insley, the motorman, was unable to release sand before his car had come to a stand, owing to the collapse of his sand pedal.

(b) Insley failed to control the run back immediately owing to the fact that he was at first on so slippery a section of rail that his brakes would not hold without sand. This was not supplied by the conductress, who was at the time on the top deck.;

(c) Insley failed to regain control of the car by injudiciously relinquishing his magnetic brake at a time when, from his previous experience in climbing the hill, he might have realised that the rail surface was at least far better than it was at the point where he first applied this brake.

I attribute this regrettable accident to a combination of unfortunate circumstances. The collapse of the sand pedal was a vital factor, and I accept Insley's statement that he took reasonable steps to ensure that it was correctly in position before leaving the terminus.

The next factor was clearly outside Insley's control, since there are no means whereby a driver can release sand behind his wheels. He had to rely on the conductress, but I hesitate to impute to the conductress blame which would attach to the breach of a definite rule on this point, particularly as several short section passengers are carried at this point, necessitating constant attention from the conductor.

Lastly, in my opinion, had Insley kept the magnetic brake in use he would at least have kept the speed of the car below the limit of danger. I do not consider he acted with that degree of judgment which might reasonably have been expected from a man of his 13 years' experience. To this extent, therefore, I must attribute some degree of responsibility to him, though his position was rendered more difficult by circumstances beyond his control. Both driver and conductress deserve credit for remaining at their posts, and the latter also for the manner in which she carried out company instructions with regard to the control of passengers.

Calling attention to the sanding arrangements, the Inspector says that the practice of this and other companies running their cars with the conductor's sand pedal lowered cannot be regarded as satisfactory. It is proved that this type pedal is apt to come out of gear and collapse at times when its use is vital. Since the accident temporary steps had been taken to meet such a contingency, but it was necessary that arrangements should be made whereby drivers could apply sand both in front of and behind their wheels. It would also be necessary for this and other companies to make such alterations in design as will ensure that sand pedals cannot fortuitously come out of gear.

LIGHT RAILWAY ORDERS.

The Ministry of Transport has recently confirmed the Liverpool and Prescot (Amendment) Order, 1919, authorising the Corporation of Liverpool to purchase the Liverpool and Prescot Light Railway.

The Ministry has also confirmed the Ashover Light Railway Order, 1919, authorising the construction of a light railway in the parishes of Stretton of Shirland and Higham of Brackenfield, and of Ashover in the County of Derby.

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INCREASE IN FARES.

In the House of Commons, on December 8, Mr. Grattan Doyle asked the President of the Board of Trade if his attention had been called to the many complaints regarding the greatly increased fares charged on tramways under the management of public bodies, rivalling, if not exceeding, the charges on omnibuses owned by companies which were seeking to make a dividend; and whether, seeing that the object of Parliament in granting the London County Council and similar authorities a practical monopoly of the public thoroughfares was to serve the interests of the community rather than to earn a dividend, before granting additional powers to these bodies, he would make it a condition that the claims of the travelling public should have first consideration.

Sir Eric Geddes (Minister of Transport) replied:—Certain tramway undertakings have been empowered to increase fares in accordance with the provision of the Statutory Undertakings (Temporary Increases of Charges) Act, 1918. Where the undertakers are a local authority, no modification may be authorised which will in any case increase the statutory maximum by more than 50 per cent., or by an amount which is more than sufficient to enable the undertaking to be carried on without loss. In view of the increases in wages and other expenses, increased charges are in some cases warranted, but the hon. member may rest assured that the claims of the travelling public are given full weight in connection with the consideration of all such applications.

Derby Corporation tramways have reverted to the 1d. fare for short stages in place of the universal 1½d. fare. There will be special rates for weekly tickets and daily return tickets for workmen and children. Councillor W. Eaton, chairman of the Tramways Committee, has predicted that the experiment will not be a financial success in view of the sum that would have to be spent for renewals and additions. They would require to spend £20,000 for new cars alone.

Alderman J. Bowes, chairman of the Manchester Tramways Committee, at the last meeting of the Council, said that there was no hope of a reduction in fares. The next step would be to increase them. They were spending nearly £500,000 a year in extra wages and war bonuses, and they did not want the tramways to come on the city rates.

At the meeting of the Hastings Council on December 5 a deputation of tramway workers asked the Council to consent to the increase of fares which the Tramways Company proposed, as that would enable the Sunday services to be run and allow the company to withdraw notices of dismissal which had been given during the week to thirteen employees.

Edinburgh Town Council, on December 3, agreed to the recommendation of the Tramways Committee that the minimum fare on the tramways be raised to 1½d.

Colchester Town Council have made increases in fares.

NEW FARES ON SHEFFIELD TRAMWAYS.

THE MINIMUM FARE RAISED TO TWOPENCE.

Sheffield City Council on December 10 adopted the proposal of the Tramways and Motors Committee that the minimum fare should be raised from 1½d. to 2d. In support of the recommendation, Sir William Clegg, Chairman of the Committee, said that not until he was absolutely driven by force of circumstances had he suggested to the Council the necessity for the increase in fares. He had been one of those who had always held the opinion that the trading undertakings of the Corporation should be self-supporting. The figures showed that at the end of June last there was a net balance on the first three months' working of the present financial year of £12,927. At the end of August this had been reduced to £11,839, and on the 20th of September, the end of the half-year, the balance had been still further reduced to £4,723. For the period from March 26th to November 29th there was a deficit of £2,764 and from September 20th, to November 20th, there had been an average weekly loss of £1,233.

Dealing with the question of wages, Sir William said that during the four weeks ended November 23, 1918, the wages bill was £20,609. In the corresponding four weeks of this year the Committee had to pay £35,000, an increase of £14,393. Since March, 1914, the cost per car mile had gone up from 9½d. to 1s. 6½d.; electrical energy was now costing 1.033d., per unit as compared with .8d. in 1914. Tramway rails had risen from £9 10s. a ton to £24; petrol had increased from 1s. a gallon to 2s. 1½d.; armature coils were 100 per cent. up, and tramcar tires cost 103s. as compared with 24s.

However startling these figures, they were less remarkable than those with regard to the wages increase. In round figures the bill had increased between March, 1915, and the present time by nearly £230,000 per annum. The money to meet these expenses must come either from fares or rates. A reasonable and business-like method would be to obtain the income from the travelling public. Notwithstanding the increases, including the one now proposed, Sheffield would still have, with one exception, the cheapest riding in the country. Including previous increases and the present proposal, the total would amount only to 50 per cent., and he hoped, although no one could foresee the future, that this increase would be the last.

Institute of Transport.—Included in the first Council, in addition to the names given in our issue of December 6, are the Right Hon. Sir Albert H. Stanley, M.P., and Sir Herbert Walker, K.C.B.

L.C.C. TRAMWAY MATTERS.

At the weekly meeting on Tuesday last the reports received from committees included the following items:—

TENDERS.—The General Purposes Committee reported that, having considered the standing order requiring the reporting of acceptances of tenders for stores exceeding the value of £500, and having regard to the existing trade conditions, they are of opinion that for the present particulars of tenders received should not be made public in any case where such a course should be considered undesirable. They recommended that until December 31, 1920, any committee which considers it undesirable to publish particulars of tenders received shall forward such details to the General Purposes Committee, together with a statement of their reasons for not reporting details to the Council, and if the committee concur, such details shall not be reported. The Council agreed to the recommendation.

TRAMWAYS AND IMPROVEMENTS BILL.—The London County Council (Tramways and Improvements) Bill, 1920, was approved, and the seal of the Council was affixed to a petition to Parliament for leave to bring in the Bill.

PUBLICITY ASSISTANT.—On October 28 the Council appointed Mr. W. W. J. Studd on probation for a period of six months as publicity assistant in the tramways department at a salary of £300, rising by increments of £25 to £400 a year. Mr. Studd has withdrawn from the appointment to accept another position, and the Highways Committee reported that they were considering what steps should be taken in regard to the matter and would report at a later date.

CARS IN SERVICE.—Mr. J. D. Gilbert, M.P., asked if any new tramcars had been ordered during the present year, what was the average number of cars running in daily service, how many cars were under repair, and had the workshops been delayed through lack of material. Mr. W. J. Squires replied that no cars had been ordered, 1,277 cars were in daily service, and 383 under repair. There had been considerable delay in the delivery of essential materials, and recently there had been increased difficulty owing to the moulders' strike.

SUGGESTIONS BY THE ADVISORY COMMITTEE.—Mr. Squires said that the Council had been requested by the Advisory Committee on London Traffic to alter with a view to alleviating congestion at certain tramway stopping places. The new proposals dealt with stopping places at (1) Dalston Junction, (2) Shoreditch Church, (3) Commercial Road, (4) Whitechapel High Street, (5) Blackfriars Road at Stamford Street, (6) Westminster Bridge Road at York Road, (7) Elephant and Castle, and (8) Brixton Station. It was proposed to bring the alterations into effect on Wednesday, December 10. The Advisory Committee had not yet come to any decision in regard to tramways or upon any of the more important questions referred to them. A request by the Advisory Committee with regard to fare charges would be dealt with by the Highways Committee next week.—Mr. Gilbert asked what the general effect of the change of stopping places would be.—Mr. Squires said he would have to consult the general manager before replying.

MISCELLANEOUS NEWS AND NOTES.

Motor Omnibuses for Walsall.—Walsall Tramways Committee propose to spend £15,000 in the purchase of motor omnibuses.

New Motor Omnibuses for Coventry.—Coventry Tramways Committee have now obtained delivery of seven new motor omnibuses, which have enabled several services to be augmented.

Women Conductors Withdrawn at Colchester.—Colchester Town Council have decided to replace their women conductors with men, preference being given to married ex-service men.

Proposed Extension at Aberdeen.—Aberdeen Tramways Committee have been instructed to report on the provision of a tramway or a motor omnibus service to the Footdee district.

Bradford's Railless Goods Vehicle.—The Ministry of Transport have asked Bradford Corporation for particulars of the railless battery goods vehicle which is used by the Corporation tramways department.

Queue System for Salford.—Alderman H. Linsley, chairman of the Salford Tramways Committee, has undertaken to bring before the Town Council a proposal for the adoption of the queue system and the publication of time tables.

Parcel Service at Derby.—A scheme for a tramways parcel service, including collection and delivery, has been adopted by the Town Council, and the Tramways Committee are to consider the necessary details.

Omnibus Service in the Dearne Valley.—The Barnsley and District Traction Company, Ltd., have applied for permission from the Wombwell Council to run a service of motor omnibuses between Wombwell and Brampton Bierlow. Permission has been granted conditionally.

East Ham Tramways Committee have recommended the acceptance of Ilford Urban Council's offer to give a lease of Ilford Hill track, viz.:—The lease to run for a definite period of three years from the 1st July, 1919, at the following rates, viz.:—1st year, 6½d. per car mile; 2nd year, 6¾d. per car mile; 3rd year, 6¾d. per car mile.

A Leyland School.—The Leyland Motor Co. are arranging with Lancashire County Council for the establishment of a day continuation school for their employees. The firm have promised an army hut for the school, it being at the moment quite impossible to get other premises. At present 170 boys will be dealt with, but there is likely to be more in the near future.

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Walsall Tramway Track.—Walsall Distress Committee recommends that the re-laying of the tramways permanent way should be undertaken in order to provide work for the unemployed.

Bradford Motor Omnibus for Deputations.—With the object of reducing the number of taxicabs and motor cars used in connection with deputations, the Bradford Finance and General Purposes Committee have recommended the Tramways Committee to provide a motor omnibus.

Motor Omnibuses as a Stand-By.—During a breakdown on the Edinburgh cable system on December 2, on the Mound to Tollcross route, the Corporation motor omnibuses were run between the termini. The halts at these points were longer than those of the tramway cars, but the time was made up by the greater speed of the omnibuses.

A Wolverhampton Investigation.—The Highways Committee of Wolverhampton Corporation report that owing to the high cost of horses, they are of the opinion that steps should be taken to introduce some form of motor traction. A trial is to be made with an electric vehicle, when comparisons will be made, and if favourable a change to this type of vehicle will be recommended in due course.

Luton Tramways.—The Electricity and Tramways Committee of Luton Corporation are discussing the desirability of the tramways, which are now leased, coming under the management of the Corporation. At a recent meeting of the Town Council, Councillor Osborne said that he would continue to protest against the Council attempting to look at "this wretched system," while it was in the condition it was.

Stepney Approves Trolley System after Ten Years' Delay.—Stepney Borough Council has given permission to the London County Council for the adoption of the overhead trolley system in Burdett Road and Grove Road. Alderman J. Provost, who moved the resolution, said that he proposed a similar resolution ten years ago, which was then defeated. Councillor Hull said that Alderman Provost deserved great credit for the perseverance he had shown in the matter in face of great opposition.

Sheffield and Rotherham Amalgamation.—In the course of a report on the advantages possible by the amalgamation of Sheffield and Rotherham, the town clerk of Sheffield points out that the tramway and omnibus service in Rotherham will be placed under the same management as now exists in Sheffield, and the conditions as to fares, service and general administration will be made as nearly as practicable the same. It is believed that this course will ensure a cheapening of fares in Rotherham as well as greater convenience.

No Fare Reduction at Dundee.—A proposal to appoint a committee to consider the management of the Dundee tramways was defeated at a meeting of the Dundee Town Council by 28 votes to 3. The supporters of the motion alleged that a great mistake had been made in increasing the fares and urged that a reversion should be made to the system of half-penny fares. Mr. G. A. Johnston, a member of the Tramways Committee, retorted that in view of the greatly increased expenditure, it was hopeless to expect that fares could be reduced.

The Consolidated Construction Company is the name of a new company which is being formed to amalgamate the contracting businesses of Dick, Kerr and Co. and J. G. White and Co. The English Electric Company, which absorbed the manufacturing interests of Dick, Kerr and Co., is interested in the new Construction Company by an acquired holding of Ordinary shares of J. G. White and Co. The latter company is unchanged in management and control and will continue to carry on its functions of engineering and operating management at its present offices, 9, Cloak Lane, London, E.C.

Middlesbrough Corporation Tramways.—Mr. H. G. Jeken, manager of the Middlesbrough section of the tramways, was introduced to the Town Council at its meeting on December 4, when details as to the working of the tramways was considered. The question of carrying trailers with the omnibuses to Seaton Carew or with the ordinary tramway cars was considered, but it was pointed out that under the Bill the use of trailers was subject to the approval of the Ministry of Transport. The town clerk stated that no approximate date could be given as to when the tramways would be taken over, as arrangements were still being considered for the forthcoming arbitration.

Manchester Tramwaymen in the War.—Employees of the Manchester Corporation tramways who served in the Forces were given an official welcome by the Lord Mayor of Manchester, Alderman Tom Fox, at an entertainment at Belle Vue Gardens, on December 4. Of 5,203 employees in September, 1914, no less than 2,917 joined the Forces, of whom 310 were killed. Thirty-two decorations were won, consisting of 1 M.C., 8 D.C.M.s and 23 M.M.'s. The youngest employee to enlist was 14 years 10 months old, and the oldest, 59 years 7 months. The Corporation has paid to dependants an aggregate sum of £258,782, and the sum collected in the cars for war charities amounted to £22,010.

Damages Against Bolton Tramways.—In an action against the Bolton Corporation tramways for personal injuries caused by the negligence of their servants, W. J. Ashworth was awarded £300. On the night of March 20 there had been a fall of snow and the footpaths were covered with snow and ice. The plaintiff, who was 62 years of age, considered the footpath dangerous and walked along the tramway track which had been cleared of the snow. He was knocked down by a car and received injuries which necessitated his absence from business. The driver of the car said that he was driving at the rate of eight miles an hour and did not see the plaintiff until he was about four yards from him. He slowed down and put on the brakes, but it was too late to avoid an accident.

Tramways v. Omnibuses at Lancaster.—Lancaster Town Council on December 4 discussed at length the advisability of scrapping the electric tramways and substituting electric or petrol omnibuses. The general opinion expressed was that although tramways are convenient, the undertaking was too small to be profitable. The route length is only 3.93 miles, and there are twelve double-deck, single truck cars, each seating forty-two passengers. The energy is supplied from the Corporation lighting station. The tramways have always been a loss to the town, the aggregate sum amounting to £40,000, and it is estimated that from £10,000 to £12,000 must be spent on the undertaking immediately. Eventually it was decided to engage a tramway expert to inspect the undertaking and to report to the Council.

Coal Shortage at Liverpool.—Alderman Fred Smith, presiding at a special meeting of the Liverpool Tramways Committee, called attention to the difficulties the tramways and electricity undertakings are experiencing owing to the shortage of coal. The previous afternoon, he said, cars were stopped for three-quarters of an hour. In spite of all the representations that had been made to the Coal Controller and the investigations of his officers, they had not supplied fuel in sufficient quantity to enable them to maintain the services. It was quite likely they might have to make further curtailments and they intended to issue a warning to the public that they must be prepared for a limitation of electric power unless the Coal Controller promptly furnished a supply of coal of the proper quality.

Christmas Day Services.—It is probable that there will be no tramcar service in Manchester and Salford on Christmas Day. It is reported that the men have unanimously decided that they will rest on that day, as they did a year ago. The *Manchester Guardian* reports that a well-known public man in Manchester, referring to the decision of the tramway workers to put their own comfort before the welfare of the community for whose convenience the tramways exist, said:—"Their decision will be deeply resented in many quarters. No one would object to one half of the employees having a holiday on Christmas Day, and the other half on Boxing Day or New Year's Day, but to cut off all services on Christmas Day is tyranny." Efforts to induce tramway employees generally throughout the country to work part of the day have been unsuccessful, and arrangements will be determined locally. London County Council will as last year be able to provide a service until 4 p.m., but after that hour the public will have to find other means of travel.

FINANCIAL.

Millars Timber and Trading Company.—A dividend of 6 per cent. on the preference shares is announced.

South Shields Corporation Tramways for the year ended March 31 last show a net profit of £3,679, which the Tramways Committee propose should be transferred to the credit of the rates.

Electric and General Investment Company.—A dividend is announced on the preference shares of 3s. per share, being at the rate of 6 per cent. per annum, for the six months ending December 31, 1919.

Yorkshire (West Riding) Tramways Company.—The directors have decided to pay on January 1, 1920, a final dividend of 3 per cent. (at the rate of 6 per cent. per annum) on the cumulative preference shares for the year ending December 31, 1919.

John I. Thornycroft & Co., Ltd.—The directors propose to recommend the payment of the following dividends for the year ended July 31, 1919: 3 per cent. on the preference shares, making 6 per cent. for the year, and 7½ per cent. on the ordinary shares, making 12½ per cent. for the year.

Wolverhampton Corporation Omnibuses.—The figures of the Wolverhampton Corporation buses for the half-year ended September 31, with those for the same period last year, are:—miles, 89,925 (60,551); passengers, 827,878 (566,539); receipts, £6,716 (£4,657); per car mile 17.924d. (18.457d.) The Corporation propose to seek Parliamentary consent to enable them to start several new services.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended December 10th amounted to £76,088, an increase of £6,919 as compared with the corresponding period last year. The route mileage was 141.67 the same as a year ago. From April 1st (the commencement of the financial year) to December 10th (thirty-six weeks and two days) the total receipts were £2,914,262, an increase of £527,675 on the corresponding period of 1918.

Hull Corporation Tramways.—The Corporation tramways show a deficit for the half-year's working ended September last of £14,000. Hitherto the undertaking has contributed to the relief of the rates, but the greatly increased cost of wages and material has more than absorbed the surplus. Fares have recently been raised and the services re-arranged with a view to increasing the revenue. Mr. E. S. Rayner, who has recently been appointed manager of the undertaking, has addressed a gathering of the employees, who promised their co-operation in an effort to put the undertaking on a sound basis.

Great Orme Tramways Company.—The directors announce a dividend of 4 per cent. When the company was formed nearly twenty years ago, the lines were constructed to a large extent out of capital borrowed on the security of the directors. Nearly the whole of the borrowed money has since been repaid out of earnings and the board now feel justified in recommending their first dividend. Last year the line was closed as it was found impossible to obtain a new cable, but this year the traffic has surpassed all records.

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United Electric Tramways of Monte Video.—The directors have decided to postpone payment of interim dividend on the preference shares until the accounts for the past year have been received, and no interim dividend will be paid on the ordinary shares.

Auckland Electric Tramways Company.—Mr. C. Sherriff Hilton, presiding at the annual meeting of the Auckland Electric Tramways Company, on December 8, said that the Corporation had exercised the option of purchasing and taking possession of the undertaking on June 1, and since that date the company had not been interested in the working of the undertaking. The whole of the purchase money was repayable in debentures of the Corporation. Mr. C. G. Tegetmeier was now on his way to Auckland to complete the arrangements in connection with the sale. The directors recommended a final dividend of 6d. per share, making 1s. per share for the year, carrying forward £9,776.

PERSONAL.

Mr. Richard Mayne, chairman of the Newcastle Corporation Tramways Committee, has been appointed Sheriff for Newcastle-on-Tyne.

Mr. A. B. Slater, manager of the Burton-upon-Trent Corporation tramways department, has been granted an increase in salary of £125 (less war bonus), with an additional £50 a year hence.

Mr. J. Makin, now general manager and electrical engineer of the Bexley Urban District Council tramways, referring to a note in our issue of October 4, asks us to mention that his former position in the undertaking was that of chief assistant to the general manager.

Councillor E. Turner has been appointed chairman of the Middlesbrough Corporation Tramways Committee, in succession to Alderman Joseph Calvert (the deputy mayor) who intimated at a meeting of the Committee on December 4 that he was unable to occupy that office owing to the pressing demands on his time.

Mr. Benjamin Hall has been appointed general manager of the Wigan Corporation tramways at a salary of £450 a year, rising by annual increments of £25 to £600. Mr. Hall has held the position provisionally for the past three months, and Councillor Guest, in recommending his appointment at the Town Council meeting, said that he had met all the difficulties as they had arisen with knowledge, ability and assurance.

Alderman E. Russell Taylor, owing to other demands on his time, submitted his resignation as chairman and member of the Liverpool Tramways, Electric Light and Power Committee at a meeting on December 5. On the motion of Councillor J. H. Naylor, it was agreed that a letter should be sent to Alderman Russell Taylor thanking him for his services to the Committee. The question of the appointment of a successor was referred to a future meeting.

CONTRACTS AND ORDERS.

Sheffield Corporation are purchasing a second-hand double-deck omnibus body from Walsall Tramways Department, at £200.

Liverpool Council has accepted tenders for special steel work for tramway loops and cross-overs from Edgar Allen and Company, Ltd. and Hadfields, Ltd.

Manchester Corporation has accepted a tender from the English Electric Company, Ltd., for tramcar motors, and from Edgar Allen and Company, Ltd., Hadfields, Ltd., and the Titan Trackwork Company, Ltd., for special track work.

Glasgow Electric Vehicles.—With reference to the question of the non-delivery of the electric vehicles which the Edison Accumulators' Ltd., and the Electric Vehicles, Ltd., are under contract to supply, the Cleansing Committee of Glasgow Corporation has decided that intimation be made to the companies that they will be held liable to the penalty provided in their respective contracts in the case of non delivery on the dates specified.

Bradford Tramways Committee have recommended acceptance of tenders for the supply of materials for track reconstruction as follows:—Walter Scott, Ltd., 400 tons high silicon steel rails, £8,400 (subject to satisfactory arrangements as to time of delivery); Hadfields, Ltd., 6 tons steel tie bars, £228; Britannia Lamp and Accessories Co. Ltd., 3,500 copper rail bonds, £659; Bayliss, Jones and Bayliss, Ltd., 18 tons wrought iron welded rings, £706 10s. od.; W. H. McKenzie, 1 ton clips, £35 5s. od.; Cordingley, Armstrong and Co., 2 tons bolts and nuts, £96; and 70 tons round mild steel rods, £1,627 10s. od.

East Ham Tramways Committee have recommended that the engineer and manager's suggestion of ordering four additional double deck cars similar to those now on order be agreed to, that the order be placed with the Brush Electrical Engineering Co., and that their offer of the car bodies at £1,320 each, with the British Thomson-Houston Co.'s equipment at £701 each, plus 5 per cent., be accepted. The Brush Electrical Engineering Co. have promised delivery of the six cars by March next, the four additional cars to be delivered as early as possible afterwards.

REQUIRED FOR PURCHASE IMMEDIATELY.

Electric Motors, 6 to 10 h.-p., D.C. Dynamos 15 to 20 Kilowatts, D.C. Portable Steam Engine, 25 to 30 B.H.P., or direct coupled 15 to 20 Kilowatt D.C. Generating Set and Portable Boiler.—Full particulars to the UNIT CONSTRUCTION Co., 168, Regent Street, W.1.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAME.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	Dec. 2	508	580	+ 72	35	19,379	+ 1,699
Aberdeen Corporation	,, 3	2,534	3,068	+ 534	26½	23,966	+ 18,521
Ayr Corporation	,, 6	395	451	+ 56	29	21,835	+ 4,318
Belfast City	,, 5	8,688	16,183	+ 1,495	36	370 611	+ 77,471
Birkenhead Corporation	,, 7	2,207	2,872	+ 665	35½	104,562	+ 25,262
Birmingham Corporation	Nov. 29	23,103	25,951	+ 2,848	35	901,433	+ 74,728
do. Motor Buses	,, 29	1,273	1,595	+ 322	35	60,618	+ 8,652
Blackburn Corporation	Dec. 3	1,494	1,925	+ 427	36½	93,854	+ 17,777
Bradford Corporation	,, 6	9,122	10,789	+ 1,667	36	410,917	+ 76,962
Burnley Corporation	Dec. 6	2,221	2,833	+ 612	..	..	..
Burton-on-Trent Cor.	,, 7	404	523	+ 119	36	18,116	+ 3,378
Bury Corporation	,, 7	1,932	2,067	+ 135	35½	85,809	+ 11,618
Chatham & District	Nov. 27	1,167	1,349	+ 182	47	71,347	+ 10,250
Cork Electric	,, 27	544	707	+ 163	47	33,215	+ 3,977
Derby Corporation	Dec. 6	1,443	1,921	+ 478	36	69,888	+ 15,677
Dundee City	,, 3	1,908	2,458	+ 550	28½	74,075	+ 18,202
East Ham Corporation	,, 6	1,618	1,881	+ 233	34½	69,246	+ 13,676
Edinburgh	Nov. 29	8,605	9,825	+ 1,220	21½	242,275	+ 44 253
Glasgow Corporation	Dec. 6	28,343	32,154	+ 3,811	27	871,234	+ 98,963
Glossop (U.E. Sup. Co.)	,, 3	194	215	+ 21	49	10,187	+ 2,135
Huddersfield Corporation	,, 6	3,587	4,713	+ 1,125	36	176,041	+ 38,769
Ilford U.D. Council	,, 6	998	1,115	+ 117	35½	42,973	+ 7,157
Ipswich Corporation	Dec. 6	617	830	+ 213	36	33,846	+ 6,296
Isle of Thanet	,, 3	259	431	+ 172	9½	5,091	+ 2,297
Kilmarnock Corporation	,, 6	276	280	+ 4	29½	8,348	+ 2787
Lanarkshire	Nov. 27	3,455	3,753	+ 298	47	174,941	+ 4,453
Leeds City	,, 6	13,750	15,859	+ 2,109	36	596,372	+ 114,938
Leicester Corporation	Dec. 6	4,751	5,970	+ 1,219	..	..	..
Leyton U.D Council	,, 4	2,391	2,689	+ 298	36	111,846	+ 28,479
Liverpool Corporation	,, 6	19,883	24,493	+ 4,610	44½	1,090,414	+ 199,846
London County Council	,, 10	69,769	76,686	+ 6,919	36½	2,914,26	+ 527,675
Maidstone Corporation	,, 4	250	313	+ 63	35½	13,982	+ 3,827
Manchester Corporation	,, 6	26,272	29,702	+ 3,430	36	1,094,447	+ 162,588
Newcastle-on-Tyne Cor.	,, 6	8,801	9,105	+ 304	35	340,971	+ 16,338
Northampton Cor.	,, 23	868	1,221	+ 353	35	44,201	+ 14,192
Nottingham Corporation	Dec. 4	5,416	6,878	+ 1,462	36	256,617	+ 50,846
Oldham Corporation	,, 7	3,364	4,222	+ 858	35	163,897	+ 35,370
Reading Corporation	Dec. 4	1,216	1,474	+ 258	36½	56,723	+ 1,244
Rotherham Corporation	,, 3	2,311	2,029	− 312	35½	74,574	− 8,443
Sheffield Corporation	,, 7	13,136	16,335	+ 3,199	36½	600,491	+ 108,275
Southampton Cor.	Dec 3	2,387	2,823	+ 436	35½	96,050	+ 4,818
,, Motor Buses	,, 3	..	158	..	18	2,361	..
Southend-on-Sea Cor.	Nov. 26	1,033	1,338	+ 305	35	78 224	+ 30,208
South Shields Cor.	,, 15	990	1,420	+ 430	33	47,313	+ 8,916
St. Helens Corporation	Dec. 2	..	1,485	..	9	14,216	..
Sunderland Corporation	,, 7	2,186	2,664	+ 478	36	103,574	+ 26,282
Tyneside Trys. & Trmds	Nov. 19	863	903	+ 40	21	25,746	+ 4,098
Wallasey Corporation	Dec. 6	1,603	2,146	+ 538	35½	91,644	+ 23,923
Walsall Corporation	,, 3	1,243	1,591	+ 348	36	53,164	+ 8,883
Walthamstow U.D. Coun.	Dec. 6	1,341	1,505	+ 164	36	62,093	+ 10,058
Warrington Corporation	Nov 20	786	897	+ 111	34	29,911	+ 4,280
West Ham Corporation	Dec. 4	4,680	5,121	+ 441	35½	191,731	+ 29,734
Wolverhampton	,, 10	1,525	2 201	+ 676	36	73,941	+ 11,929

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Wks.	Aggregate. 1918-19	Increase or Dec.
Anglo-Argentine	Dec. 9	£63,629	68,920	49	£2,906,150	+ £159,650
Ballarat and Bendigo(4 wks)	Oct. 12	3,691	4,176	28	23,563	+ 41
Brazilian Traction (Mlrs.)	Oct.	8,052,000	9,980,003	43	93,539,000	+ 7,757,000
Brisbane	Sept.	35,400	41,970	39	346,370	+ 20,516
British Columbia $	Oct.	580,354	710,405	17	2,704,611	+ 590,474
Buenos Aires Lacroze	Nov	42,952	50,635	21	237,705	+ 28,941
Burmah Tram. & Light Rs.	Oct.	34,848	51,898	13	138,733	+ 31,194
Calcutta Rs.	Nov 22	82,201	90,980	45½	..	+ 534,116
Carthagena and Herrerias	Nov.	2,988	2,519	44	99,518	− 14,396
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	Nov. 1	1,942	2,709	17	11,156	+ 3,551
Hong Kong $	Oct, 25	14,216	14,103	43	631,531	+ 36,432
Kalgoorlie	July	2,798	2,815	30	18,657	— 126
La Plata	Nov.	5,884	6,240	45	61,479	− 6,653
Lima	Sept	42,838	48,780	39	429,615	+ 39,887
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Oct. 31	39,598	46,552	42	838,454	+ 40,968
Manila $	Sept.	204,200	223,049	39	1,833,199	+ 181,918
Montevideo	Sept.	29,611	35,552	47	404,501	+ 57,428
Pernambuco	Dec. 7	5,255	7,920	48½	265,217	+ 51,883
Para	Oct.	22,442	27,849	47	278,861	+ 9,371
Peruvian $	July	987,300	1,038,780	..	..	..
Rangoon	Nov.	6,611	7,379	48	74,530	− 7,726
Shanghai (2 weeks) $	Apr 23	50,760	58,755	16	447,279	+ 53,577
Singapore $	Nov. 18	14,161	17,317	42	647,123	+ 63,413
Toronto $	Oct.	1,018,478	1,123,801	43	10,442,252	— 202,316
Winnipeg $	Oct.	295,005	425,339	42	3,375,399	+ 406 257

CARS, MOTORS, CONTROLLERS.

(DICK, KERR SYSTEM.)

THE ENGLISH ELECTRIC COMPANY LIMITED,

Queen's House, Kingsway, LONDON, W.C.2.

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THE Tramway & Railway World
WITH MOTOR TRAFFIC SECTION

Founded 1892. LONDON, DECEMBER 18, 1919. VOL. XLVI.

THE TEES-SIDE RAILLESS TRACTION SYSTEM.

By WM. PORRITT INGHAM, M.Inst.C.E.
(Engineer during Construction.)

The opening of the Tees-side railless system, formerly known as the North Ormesby, South Bank, Normanby and Grangetown Railless Traction System, which was inaugurated on November 8, comes at an opportune moment. The Ministry of Transport, which is just now being organised, was formed to consider amongst other transportation problems that of the most economical and efficient system of traction for districts where sound roads exist, but which, owing to their comparatively light traffic do not in the first instance warrant either the cost of a light railway laid along the side of the roadway or a paved tramway forming a part of the highway. The latter system, owing to the increased cost of both material and labour, has now risen from the pre-war level of about £4,500 to between £12,500 and £15,000 per mile of single track, exclusive of loops or passing places. To justify this large expenditure fares would require to be fixed beyond the economical value that would result in a satisfactory revenue. In fact, it would appear that the single-track tramway for the above reason is doomed to failure. Owing to the spacing of the passing-places, it is not elastic enough to provide a service that would earn enough to pay a fair interest on the capital outlay involved.

The double-track system is likely to be applied and maintained for densely-populated districts, provided it be relieved from unfair burdens, such as the maintenance of the paving, which is used only by other vehicular traffic contributing nothing to its upkeep, and from costly street widenings that may not be actually required for its own construction.

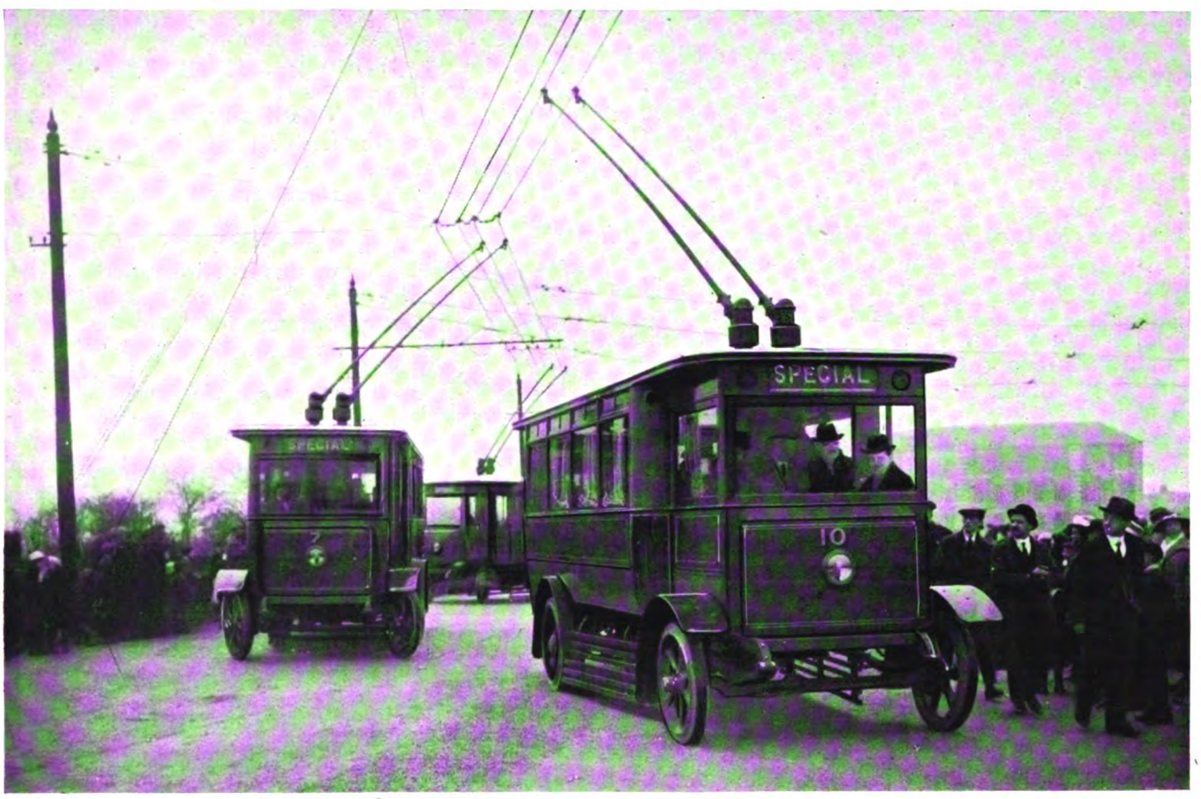

Fig. 1.—Railless Cars Conveying Passengers at the Opening of the Tees-Side System.

The choice of system for the Tees-Side district was limited to the single-track tramway, the petrol-driven omnibus, and the trolley omnibus. Owing to the limited service required, a tramway system could not be justified. The merits of the petrol-driven motor

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omnibus then came under review. In considering the claims of this type of vehicle it had to be borne in mind that here, as in many other large industrial areas, a cheap source of electric supply was available, as current could be obtained at three farthings per unit (the price now being paid). Depending upon the grades and the state of the road surface, the current consumption of a trolley omnibus has been found to vary from ·75 units to 1·25 units per omnibus mile. The petrol consumption of the motor omnibus is similarly affected. The present cost of petrol per omnibus mile, as taken from the address made by Mr. A. R. Fearnley, general manager, Sheffield Corporation Tramways and Motors, before the Municipal Tramways Association on September 18 last, is 5·55 pence.* Should the petrol consumption for the London omnibuses, running on possibly the finest road surfaces in the world, be taken as a basis for the calculation of that for a rural or provincial town service, a serious error would be made. Since the construction of the North Ormesby Railless System (1915–1916), although the price of ¾d. per unit for electric power has remained constant, the wholesale price of petrol has risen over 150 per cent. (*vide* the "Report upon the Fares and Working Expenses" of the London General Omnibus Company, Limited, by Sir Arthur F. Whinney, K.B.E., as presented to Parliament†).

The cost of operating the railless omnibus as far as electric power is concerned will not exceed one penny per omnibus mile. There is, therefore, a net saving on this item of 4½d. per omnibus mile.

The next point to be considered is, how much does it cost to maintain the petrol engine, clutch, gear box, differential, radiator, magneto, and lighting set of a petrol-driven omnibus, as against the two electric motors, two worm drives (without a differential), controller and two trolley booms of the railless vehicle? There is a railless system in the North of England that has been in constant operation since the year 1913, where the cost of maintaining the motors and other electrical equipment has only averaged £20 per railless omnibus per annum. It is quite safe, therefore, to claim an economy of at least one penny per omnibus mile in the maintenance of the drive of a railless omnibus as against that of the petrol omnibus.

In organising any undertaking there are several economic principles which are of general application. The capital raised is expended in plant and tools, the life of which is necessarily limited, and provision must always be made to maintain the plant, etc., in efficient working condition, and at the same time a yearly reserve must be made sufficient to replace the plant at the end of its useful life. In a settled country where a reasonably accurate estimate of the receipts and cost of maintenance and life of plant can be made, the question of first cost is governed by the cost of maintenance and the estimated life of the plant, i.e., the actual first cost may be high, but the maintenance may be low and the yearly charges for replacement at the end of the life of the plant may also be low. Within limits, the higher the initial expenditure, the lower the charges for maintenance and depreciation.

In the past the railless system has in many cases been rejected because of the simple fact that, in spite of a cheap source of electrical power being available, the petrol-driven omnibus has been adopted. An exaggerated importance has been given to the initial cost of overhead equipment, and no calculation has been made of the cost per omnibus mile covering interest, maintenance and sinking fund for such equipment.

The cost per omnibus mile of the necessary overhead equipment for the railless omnibus has now to be considered. In the same way that trackwork has advanced in cost over pre-war values, so has the overhead equipment, and the latter at the present day stands at approximately £3,000 per route mile. The economic limits of a railless system are reached when the interest on, and maintenance, depreciation and sinking fund of the overhead equipment neutralise the saving on petrol and power drive.

With a seven and a half minutes omnibus service and allowing for an average speed of seven miles per hour inclusive of stoppages, the service being in operation for 16 hours per working day and a reduced Sunday service, 88,000 omnibus miles would be run over a route mile of overhead equipment per annum. The interest on capital, maintenance, and sinking fund of the overhead equipment operating at various services is as follows:—

7½ minutes' service	... ...	·73d. per omnibus mile.
15 " "	... ...	1·46d. " "
30 " "	... ...	2·92d. " "

In the above calculations interest has been taken at 5 per cent. per annum, maintenance of the overhead equipment at ·147 pence per omnibus mile, and sinking fund over the Board of Trade required period of 20 years.

With regard to the sinking fund that the Board of Trade requires to be made for the overhead equipment, the total life of such equipment has been fixed at 20 years, and during this time the original capital outlay has to be written off out of revenue. This life is, of course, too short, there being many overhead tramway lines in this country that have been in use beyond this period, and that are practically, at least as far as the steel poles are concerned, almost as sound as when originally erected.

The average omnibus service upon the Tees-side system is one of 15 minutes. Additional railless omnibuses have, however, been provided to give an increased service as soon as it is warranted. The total estimated saving per trolley omnibus mile from the above-mentioned figures, and for a 15 minutes' service, is:—

	Per omnibus mile.
Motor omnibus—Petrol	5·55d.
Trolley omnibus—Electrical power ...	1·00d.
Overhead equipment ...	1·46d.
	2·46d.
	3·09d.
Additional estimated saving on electrical as against the petrol drive	1·00d.
	4·09d.

This saving of 4·00d. per omnibus mile, upon a 15 minutes' omnibus service for the whole length of the route of 5·1 miles, is equivalent to £3,824 per annum, a sum sufficient to pay over 6 per cent. interest upon the capital of the entire undertaking.

Since the railless system was originally decided upon, there has been a considerable increase in cost of both the overhead equipment of the trolley omnibus, and in petrol for the motor omnibus, but the balance is distinctly in favour of the system as adopted. The choice of the railless system has, therefore, more than ever been justified.

The aggregate length of the Tees-side railless trolley routes is 5 miles 176 yards. The steepest gradient on the routes is 1 in 20. Electric energy for driving the cars is supplied by Messrs. Bolckow, Vaughan and Company from their Cleveland Iron and Steel Works at South Bank, at 550 volts D.C.

Tubular steel poles, erected in concrete, are employed of three different strengths, light, medium and heavy,

* The full text of Mr. Fearnley's paper was given in THE TRAMWAY AND RAILWAY WORLD of October 16, 1919.

† *Vide* THE TRAMWAY AND RAILWAY WORLD of July 9, 1919.

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made to the British Engineering Standards Committee's specification. Light poles are used on the straight sections of the route, medium poles at moderate curves, and heavy poles at sharp curves and at the terminal loops. Side bracket arms support the trolley wires, and two pairs of trolley wires are employed throughout, the negative trolley wires being placed on the outside. The bracket arms are of lap welded steel tube and vary in length according to the width of the roadway. Figs. 2 and 3 show the general design of the poles, bracket arms, and fittings, and also the method of suspending the trolley wires.

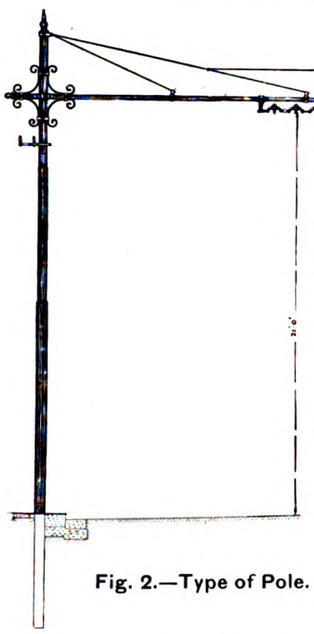

Fig. 2.—Type of Pole.

The trolley wires are of 3/0 S.W.G. hard drawn copper, so arranged as to allow the omnibuses to work with under-running trolleys. There is treble insulation between the positive and negative wires, double insulation between the two positive wires, and single insulation between the negative wires and the pole. In accordance with the Board of Trade regulation, the trolley wires are divided into half mile sections by section insulators. The positive wires are connected across at these sections by means of insulated cable brought down the inside of the poles to switch boxes attached to the poles. By this arrangement any half mile of positive wire can be disconnected from the rest of the system.

On the straight lengths of the route 18 inch ears have been used and 24 inch ears on curves. The guard wires are insulated throughout and connected to the negative trolley wire in accordance with the Board of Trade requirements.

At each of the three termini the trolley wires are erected in the form of a loop, to enable the omnibuses to be turned with one lock of the steering gear. On reference to Figs. 5 and 6 it will be noticed that there are two different forms of loop. The one at Normanby Road terminus is symmetrical in shape, the width of the roadway allowing for this, while the one at Grangetown terminus is lobsided to enable the omnibuses to turn in the intersection of the cross roads. There is only one single junction on the system, the arrangement of which is shown in Fig. 7.

Fig. 3.—Light Poles Used on Straight Sections.

In order to obtain good voltage conditions at all points on the line, it was found necessary to augment the copper in the trolley wires. This was done by running ·2 square inch feeder cables from the sub-station, where the supply is taken at 550 volts, to a point about half a mile distant. The feeder cables are in the form of bare copper conductors carried overhead on brackets attached to the poles. A complete overhead telephone system has been installed connecting each termini with the car depot.

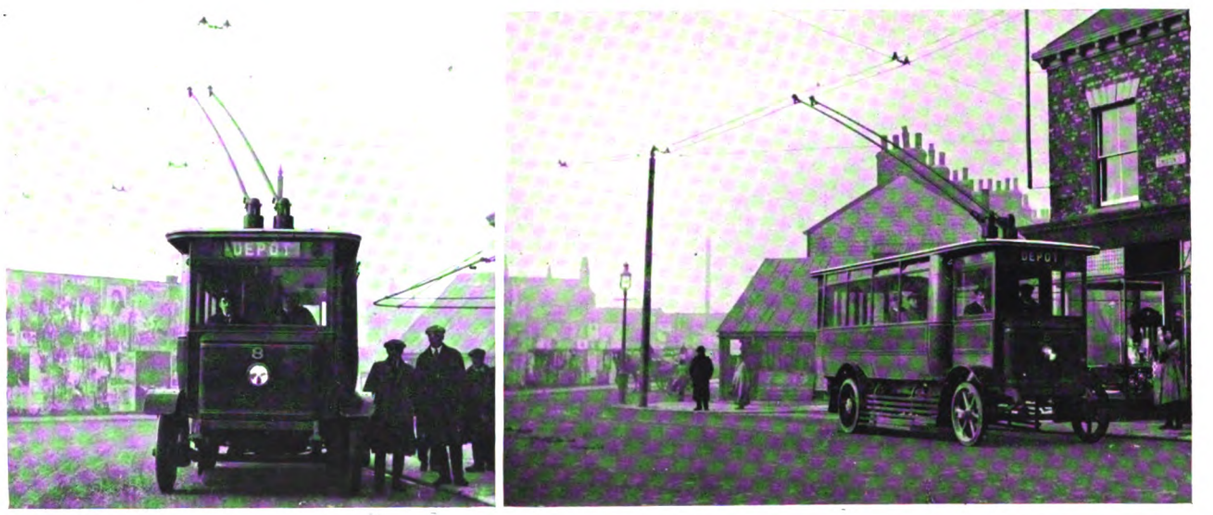

Fig. 4.—Railless Omnibuses Stopped at Roadside to Pick Up Passengers.

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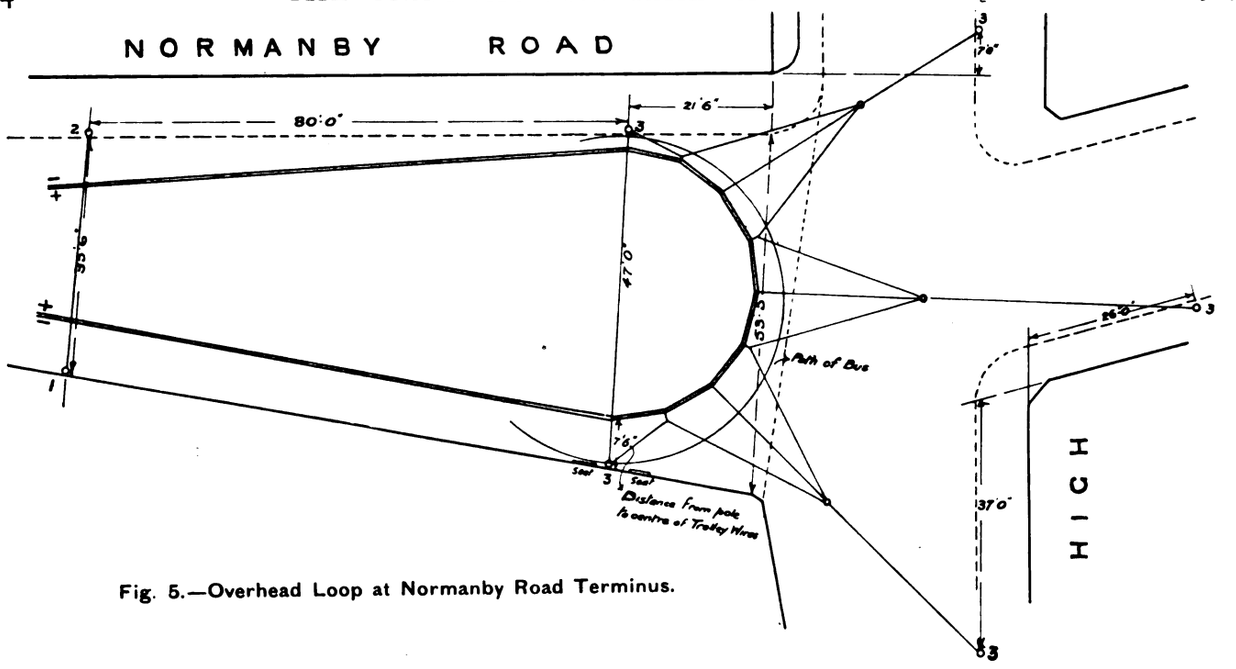

Fig. 5.—Overhead Loop at Normanby Road Terminus.

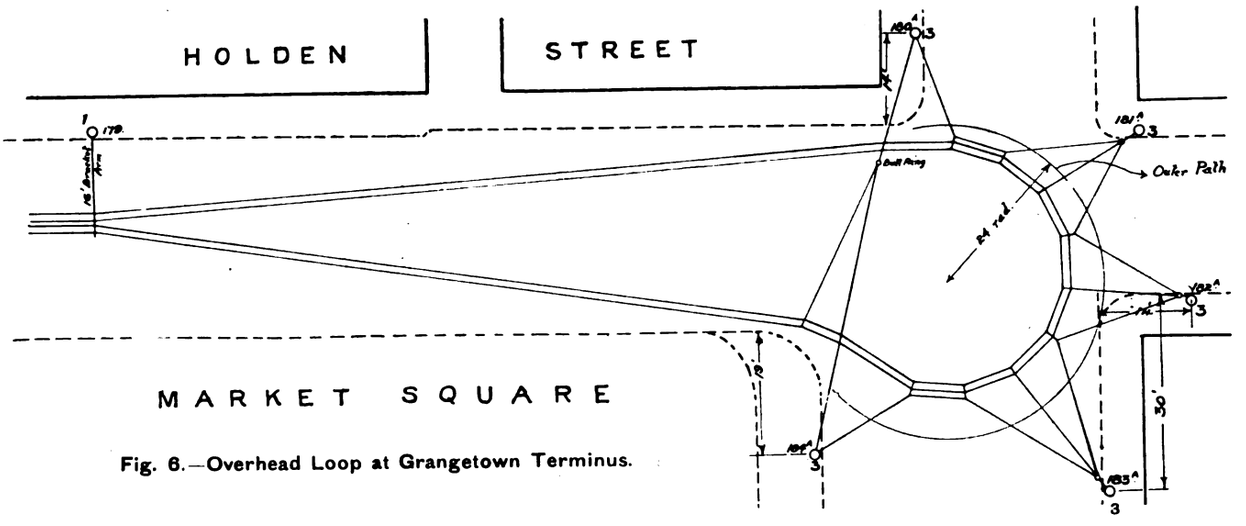

Fig. 6.—Overhead Loop at Grangetown Terminus.

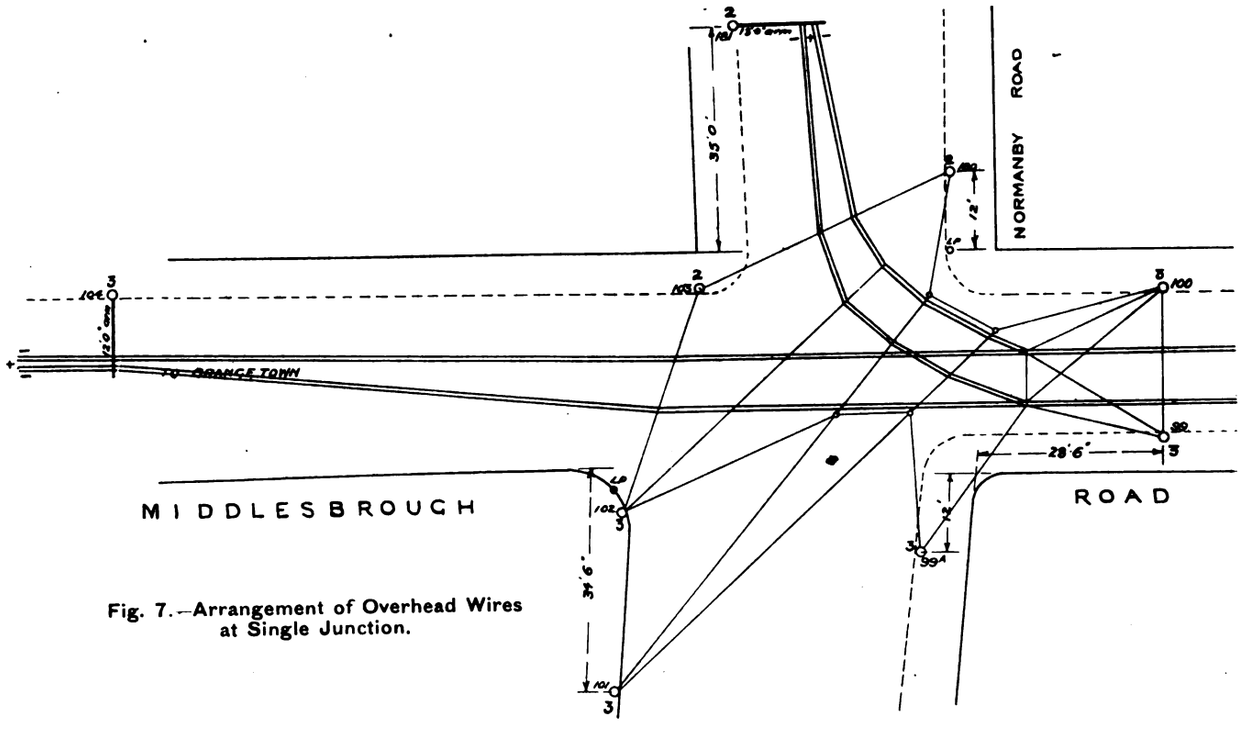

Fig. 7.—Arrangement of Overhead Wires at Single Junction.

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The contract for the overhead line and feeder equipment was carried out by Messrs. Clough, Smith and Company, Limited, of 36, Victoria Street, Westminster, London, S.W.1. This firm have specialised in the construction of railless systems, and had previously completed several other such undertakings in various parts of the country.

The ten cars with which service has been inaugurated were supplied by Railless, Limited, 56, Moorgate Street, London, E.C.2, and are of the single-deck vestibule type. The accommodation comprises 28 seats for passengers, as well as a liberal space for standing room. The seating plan is arranged for easy ingress and egress, a very necessary feature in a district where the vehicles are certain to be patronised by large numbers.

Each car is equipped with two 23 H.P. electric motors, each motor driving one rear road wheel through worm reducing gear and live axle. The manufacturers claim that the motors are capable of sustaining a heavy overload, are able to ensure a high rate of acceleration, and have ample power to maintain schedule speed, even when the cars are heavily overloaded. These features, combined with a convenient seating plan, should avoid loss of time at stopping places and permit of a high average speed being maintained.

Speed control is entirely electric, no mechanical change-speed gear box being necessary, and acceleration is smooth and uniform. Another feature of the electric control is that it is adapted to efficient working at a number of different speeds. There are two sets of brakes, the service brakes on the rear road wheels being operated by foot and hand, and the emergency brakes on the propeller shafts by foot pedal only. The emergency brakes are capable of bringing the car to a standstill from full speed within a short distance.

The easy riding of the cars is due to the bodies being suspended on long springs, supplemented by auxiliary springs, which come into action when the cars are overloaded. The wheels are fitted with solid rubber tires of ample dimensions to minimise the effect of road shocks.

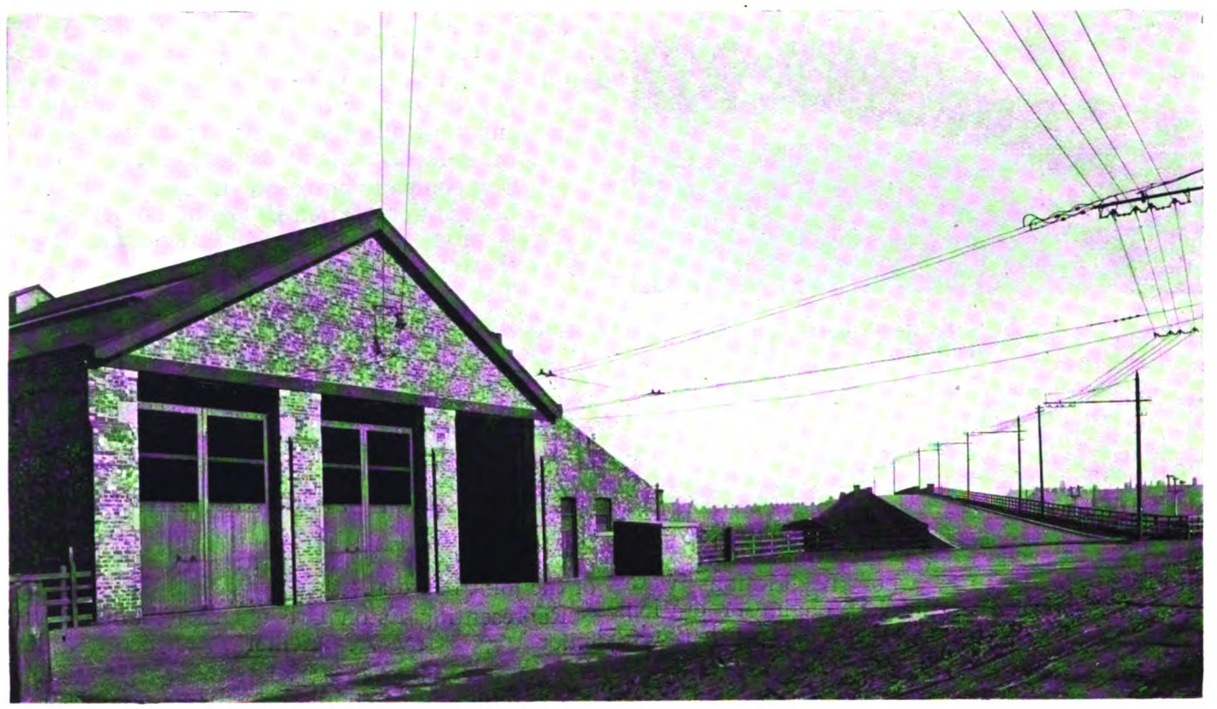

Fig. 8.—Front of Car Shed and View of Line over the Bridge.

The car shed (Figs. 8 and 9) is of brick, and measures 175 ft. long by 50 ft. wide and 16 ft. high from the floor to the eaves. It has three entrance doors, each 12 ft. wide and 16 ft. high, and is lighted by side windows and two skylights running the whole length of the roof. The shed has ample room for 20 cars.

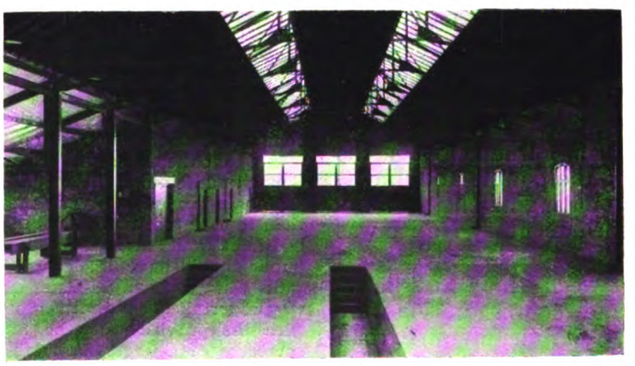

Fig. 9.—Interior of Car Shed.

Adjoining the shed is a repairing shop, 75 ft. long by 20 ft. wide. There are also general store rooms, ticket office, manager's and traffic offices, and also a large mess room fitted with cooking range and lavatories, etc. The whole of the buildings are heated by a central hot water system, and electric lighting is provided throughout. The contractors for the car sheds, etc., were Messrs. Stephen Coates and Company, Limited, of North Ormesby.

To obviate the difficulty of crossing the North Eastern Railway at South Bank on the level, a bridge had to be built with the necessary road approaches, abutments, etc. This bridge (Fig. 10) has a clear span of 76 ft. 9 in. and the main steel girders are 7 ft. 6 in. deep. The flooring of the bridge is formed by cross girders, steel plates and concrete, and footpaths are carried by steel brackets

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attached to the outside of the main girders, the footpaths being each 5 ft. wide and protected by parapet fences. The gradient of the bridge approaches is 1 in 20 (Fig. 8). The total width of the road is 35 ft., inclusive of the footpaths. The contract for the abutments, roadway, approach, embankments, etc., was carried out by Mr. John Lant, of Tyne Quarry, Newcastle-on-Tyne, and the steel work of the bridge was supplied

Fig. 10.—Bridge Over the North Eastern Railway at South Bank.

by the Tees-side Bridge and Engineering Company, Limited, of Middlesbrough.

The undertaking is under the control of the Tees-side Railless Traction Board, which consists of three representatives appointed by the Eston Urban District Council, and three representatives appointed by the Middlesbrough Corporation. This joint board was formed in October, 1918, when negotiations were commenced between the Middlesbrough Corporation and the directors of the North Ormesby, South Bank, Normanby and Grangetown Railless Traction Company. The Corporation of Middlesbrough were promoting a Bill in Parliament to acquire the tramway system, owned and worked by the Imperial Tramways Company, Limited, within the borough, and it was considered desirable that all the tramway facilities in the district should be controlled by the Municipality rather than by a private company. They then approached the Trolley Vehicle Company which held the concession, asking whether they were prepared to sell to the Corporation their undertaking, as comprised by their Act of 1912.

The directors of the company considered the Corporation's request to purchase, and subsequently intimated their willingness to advise their shareholders to sell the undertaking, authorised by the company's Act, on certain terms. At this stage the Corporation of Middlesbrough had to give public notice of their intention of promoting a Bill in Parliament for the purpose (*inter alia*) of acquiring the powers and undertaking of the company and exercising all their powers by the Corporation, and the Parliamentary Notice was duly published on November 19, 1918.

Whilst the negotiations between the directors of the Trolley Vehicle Company and the Corporation were in progress, it was ascertained that the Eston Urban District Council were prepared to co-operate with Middlesbrough in the purchase and transfer of the undertaking to the two local authorities, and subsequently representatives from the two authorities met on December 30, 1918, and terms were agreed between them for the formation of a joint board, with equal representation by both local authorities—Eston Urban District Council to be responsible for two-thirds of the undertaking and Middlesbrough one-third.

Representatives of the two authorities were then appointed to negotiate terms for the purchase and transfer of the undertaking with the trolley Vehicle Company, and at a meeting held at the Municipal Buildings, Middlesbrough, on February 3, 1919, terms were there agreed upon by all parties, and the official record of the agreement arrived at is as follows :—

(1) Subject to the approval of Parliament the company to sell the undertaking authorised by their Act of 1912, as it stands to-day, with all its rights, assets, and privileges, obligations and responsibilities.

(2) The joint board agree to purchase the undertaking of the company, as outlined in Clause (1).

(3) The purchase price to be the sum of £40,000, plus the contract cost of the railless trolley cars, and plus all other sums properly expended by the company from this date.

(4) The company agree not to oppose the Middlesbrough Corporation Bill or any other Bill which is promoted to carry out the same object on these terms.

(5) That the company will support the application to Parliament for powers to acquire the undertaking of the company on these terms.

The powers for the establishment of the Tees-side Railless Traction Board for the purpose of acquiring by purchase and of completing, managing and carrying on the undertaking of the Trolley Vehicle Company were included in the Middlesbrough Corporation Act, 1919, and Royal Assent was eventually given thereto on August 15, 1919. The following were subsequently appointed by the two authorities as the first members of the joint board :—

Representing Eston Urban District Council—Councillor W. G. Grace, Councillor T. M. Scott, Alderman Jas. Powell.

Representing Middlesbrough Corporation—The Mayor (Councillor Jos. Calvert), Alderman T. Gibson Poole, Alderman J. T. Pannell.

At the first meeting of the joint board, held on September 22, 1919, Councillor W. G. Grace was appointed the first chairman. Mr. Marten Turner has been appointed general manager and engineer of the undertaking controlled by the Joint Board.

TRAMWAY FARES.

Mr. GRATTAN DOYLE, in the House of Commons, on December 8, asked the President of the Board of Trade if his attention had been called to the many complaints regarding the greatly increased fares charged on tramways under the management of public bodies, rivalling, if not exceeding, the charges on omnibuses owned by companies which were seeking to make a dividend ; and whether, seeing that the object of Parliament in granting the London County Council and similar authorities a practical monopoly of the public thoroughfares was to serve the interests of the community rather than to earn a dividend, before granting additional powers to these bodies he would make it a condition that the claims of the travelling public should have first consideration.

Sir ERIC GEDDES (Minister of Transport) replied : Certain tramway undertakers have been empowered to increase fares in accordance with the provision of the Statutory Undertakings (Temporary Increases of Charges) Act, 1918. Where the undertakers are a local authority, no modification may be authorised which will in any case increase the statutory maximum by more than 50 per cent., or by an amount which is more than sufficient to enable the undertaking to be carried on without loss. In view of the increases in wages and other expenses, increased charges are in some cases warranted, but the hon. member may rest assured that the claims of the travelling public are given full weight in connection with the consideration of all such applications.

Proposed Electric Railway from Madrid to Valencia.—The Public Works Office has fixed January 19, 1920, as the latest date for receiving tenders for the concession to construct and work an electric railway from Madrid to the Port of Valencia.

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ONE-MAN CAR OPERATION IN AMERICA
IN FAVOUR WITH PUBLIC AND OFFICIALS.

The Safety Car Committee of the American Electric Railway Association recently completed an exhaustive inquiry into the advantages of the one-man car, and they presented an interesting report at the annual meeting of the Association in October, embodying the result of their investigation. Although the subject is not of immediate importance to tramway undertakings in the United Kingdom, managers follow the trend of opinion in America with interest, and for this reason we give the following abstract of the report :—

Your Committee feels, after its study of the subject, that the topic assigned to it represents the most important improvement in street railway operation that has been brought out in the last decade.

Our investigation indicates that the subject of one-man car operation naturally divides itself into two fundamentally different cases :

1. The mere rearrangement of existing two-man cars so that they can be operated by one man, thus saving platform expense, and, if equipped with safety devices, making an improvement in accident cost.

2. The creation of an entirely new type of car of low weight, greatly improved safety, and more rapid acceleration and deceleration. This car of the light-weight safety type not only saves platform and accident expense, but permits an improvement in service, such as well nigh to revolutionise the street railway business.

The operation of street cars by one man in small communities where small receipts per car-mile demanded the utmost economy in operating expenses, is not a new idea in the street railway business, the practice having been followed for years by many of the smaller companies ; but the modern light safety car represents a radical improvement in the whole art of urban transportation, and therefore will be the principal topic discussed in our report.

The motor car was what produced the light safety car. Its popularity proved beyond a possibility of doubt that frequent, quick service would get passenger business away from the slow and infrequent street car, and it was up to the street railway industry to develop light cars that would simulate jitney service. Following this idea, Charles O. Birney designed the car that now bears his name. It was realised that the car must be light in order to accelerate quickly and that it must be operated by one man in order to compete with the jitney which was similarly manned. The safety devices followed from the realisation that the public would not patronise the car unless it was convinced that it took no more chances in doing so than with the two-man car.

Car Weighs 6½ Tons and Seats 32 Passengers.

The new car, weighing only 13,000 lb. and seating 32 people, had to be designed from the bottom up—wheels, axles, truck, body and motors were all radical departures from previous practice, and the automatic safety features alone were a triumph of adaptation to the compelling forces which led to the development of the new car. In general, these safety devices consisted of ways to make the operation safe in case the operator dropped dead, or slackened in attention. The "dead-man's handle" required that the operator have his hand constantly on the controller or it would throw off the power. Similarly, if the power were so thrown off, the brakes would be automatically applied and sand fed to the track, and, when the car came to a stop, the doors, previously held securely closed by air pressure, are made available for manual operation to form emergency exits if desired.

The committee desires to emphasise the importance of the safety devices in one-man operation. We are advised that practically all of the cases of unfavourable action by the public or public bodies against one-man car operation have been where no safety devices were installed on the cars.

In order to support our own opinions with the largest possible reinforcement of opinions of those engaged in the business, questionnaires were sent out to all member companies. These questionnaires were prepared after a full committee meeting and cover all phases of the subject. The companies replying numbered 93, representing 1,123 one-man cars. It was found, in general, that more than half of the companies reporting were 100 per cent. one-man operated, and that 41 per cent. of all cars of the reporting companies were one-man operated.

Over 2,000 One-man Cars.

The total number of light safety cars in operation in the United States at the present time, allowing for deliveries which will be made up to the time this report is presented, is 1,100. The number under order and in process of manufacture is 600—among the latter an order for 200 for the Brooklyn Rapid Transit Company. The total number of one-man cars, including safety cars, in use in the United States is somewhat more than 2,000.

Replies to Questionnaires.

Power Consumption.—Companies using the safety car report an average reduction in energy consumption per car-mile of 51·2 per cent. Taking 3 KW.HR. per car-mile as a fair average for most city systems, this means a saving of about 1·5 KW.-HR. per car-mile. Actual figures from 45 companies show energy consumption of safety cars ranging from 0·8 to 1·75 KW.-HR. per car-mile, fully achieving on the average the calculated saving of 1·5 KW.-HR. per car-mile.

Trainmen.—Replies showed that the operator of a one-man car was paid more than either trainman in two-man car operation by 62·5 per cent. of the companies answering the question.

As to the feeling of the trainmen toward one-man cars the replies showed :—Favourable, 83 ; unfavourable, 10 ; per cent. favourable, 89·2. The same ratio was reported as to opposition by train-men to the inauguration of one-man car operation, the opposition being classified as seven, due to labour union feeling and three due to apprehensions of the men as to the difficulty of accounting. Only two companies out of 45 report the trainmen disliking the safety cars.

In answer to the question as to whether or not trainmen had been assured they would not lose their jobs due to the starting of one-man operation, 39 companies reported that they had made this promise, 42 that they had not.

The Public.—The attitude of the public toward one-man cars when started was reported as friendly by 84 and unfriendly by 15. This latter number was changed to four after a trial of the cars themselves, thus resulting in a final public verdict of 96 per cent. in favour of the one-man cars.

The action reported by public bodies toward one-man cars was as follows :—

Cases of favourable action by city commissions ...	10
Cases of favourable action by State utility commissions	11
Instances of defeat of proposed unfavourable State laws	3
Refusal of city council to pass prohibitory bill introduced by labour	1

Only two unfavourable acts by public bodies were reported, one by a district court and one by a city

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commission, but in these cases the safety car was not at issue.

Regarding the question of fare collection with one-man cars, replies showed no difficulty or not any change from conditions with two men in 88 cases, and the three companies reporting difficulty said it was only to a limited degree.

Schedules.—The replies to the questions under this heading had to be clearly distinguished as between light-weight safety cars and converted one-man cars, because the latter could not, of course, expect to effect any change from their former schedule. Regarding headway, the average increase in number of cars operated on lines using safety cars was 43·7 per cent. Similarly, with schedule speed this was increased an average of 14·76 per cent. with the safety cars, thus making an average increase in car frequency of 58·46 per cent. As to lay-over time, more was found needed by 12 companies, but no additional time was required by 75 companies.

As indicating the wide range of adaptability of safety cars, headways from one minute to thirty minutes were reported.

Earnings.—The success of the safety car in building up traffic was indicated by the answers to these questions. Of course, with converted former two-man cars, no effect in increased earnings was observable. The average for the six companies using safety cars which were the most successful shows the following :—

Gross receipts per car-mile before one-man car operation, cents.	21·11
Gross receipts per car-mile after one-man car operation, cents.	20·65
Decrease in gross receipts per car-mile, per cent. ...	2·3
Increase in car-miles operated, per cent.	53·4
Increase in total gross earnings, per cent.	51·1

In one city of 125,000 population, an increase of 70 per cent. in car mileage on lines where the safety cars were operated produced an increase of 71·2 per cent. in total gross earnings from the lines in question.

The replies as to the effect of light safety cars in eliminating jitney competition do not make a very impressive showing statistically, partly, however, because in a large proportion of the companies reporting no such competition existed, but nine companies report complete and two companies partial elimination of this competition through the use of safety cars.

Operating Features.—Various degrees of accident reduction were reported by 47 companies and no such effect noticed by 22. It is significant to observe in this connection, that the number of companies operating one-man cars without any safety devices is 24.

On car maintenance, the replies were necessarily inconclusive, due to the comparatively brief time the safety cars have been in operation, but six companies report a reduction of 50 per cent. in car-mile maintenance cost with safety cars and others predict various savings in the future. Naturally no saving in car maintenance can be secured where the former two-man car was simply rearranged for one-man operation.

A saving in the cost of track maintenance was predicted by 52 companies. Two large systems advise that they propose a reduction of 20 per cent. to 30 per cent. in rail weight if safety cars are accepted as the standard type.

The acceleration of safety cars in miles per hour per second, as compared to the average car on the system, showed :—

Average car	1·67
Safety car	2·53

Distribution.—That the application of safety cars is not to be restricted to unimportant operation—light traffic lines, etc.—is shown by the following table, indicating the use of such cars based upon the population of respective cities :—

	One-Man Cars	Safety Cars
25,000	272	27
25,000 to 75,000	422	178
75,000 to 150,000	367	167
Over 150,000	96	59

Conclusions.—The answers to the general question of whether the experience with one-man car operation would lead the company to favour the extension of its use, show the following striking results :—

Extension favoured by	76
Extension not favoured by	2

What Safety Cars Can Show.

In order to indicate clearly the effect to be expected from the results already actually obtained by street railway companies, from the use of safety cars, the following typical example has been worked out :—

Present Conditions.

Length of route, miles	4
Average speed, miles per hour	8
Cars operated	6
Headway, minutes	10
Gross per car-mile (5-cent. fare)	25 cents.

Conditions with Safety Cars.

Average speed, miles per hour	9
Cars operated	9
Headway, minutes	6
Increase in car-miles, per cent.	66⅔
Gross per car-mile	24 cents.

The safety cars can be purchased on the basis of 20 per cent. cash and the balance in equal monthly instalments, with interest at 7 per cent. on deferred payments, covering a period of five years. The average annual charge then becomes :—

One-fifth of purchase price of $6,000	$1,200
Interest (average per year)	170
Average per year for five years	$1,370

The showing then becomes as follows :—

Earnings :—	
Present 315,210 car-miles per year at 25 cents.	$78,802.50
Future 525,350 car-miles per year at 24 cents.	126,084.00
Increase in gross earnings	47,281.50
Expenses affected by changes :	
Annual cost of cars—nine at $1,370 ...	$12,330
Power :—	
Present ... ... 315,210 × 3 = 945,630 kw. hour	
Future ... ... 525,350 × 1.5 = 788,025 kw. hour	
Saving ... ... 157,605 kw. hour	
At 0.8 cent. for fuel = $1,260.84	
Trainmen's wages :—	
Present—216 hours at 45 cents.	$97.20
Future—162 hours at 50 cents.	81.00
Daily saving	$16.20
Per year, 365 × $16.20 = $5,913	
Accidents :—	
Present 5 per cent. of $78,792.50	$3,939.63
Future 2½ per cent. of $126,084.00 ...	3,152.10
Saving	$787.53
Car maintenance :	
Present—3 cents. × 315,210 car-miles ...	$9,456.30
Future—2.1 × 525,350 car-miles	11,032.35
Increase	$1,576.05
Total increase in operating expenses ...	$5,944.68

Results.

Increase in annual net earnings from the use of safety cars on the line	$41,336.82

This result is secured :—

1. While paying out of operating expense the investment in new cars to do the work.

2. While giving the patrons of the line 66·2/3 per cent. increased car frequency and 12½ per cent. increased speed.

3. Without any allowance for the savings in track maintenance from operating a 13,000-lb. car as against a 35,000-lb. car.

4. While increasing the net earnings per mile of track per year for the line (estimated as double

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tracked) by $4,580 or 6 per cent. on a track valuation of $76,500 per mile of single track.

CONCLUSIONS AND RECOMMENDATIONS.

1. The safety car is one of the most important improvements in street railway service that has appeared for many years. Its valuable features in the order of their importance are :—

(*a*) Greatly improved service to the public, both as to frequency and safety.

(*b*) Increased earnings for the company.

(*c*) Decreased operating expenses.

2. One-man operation alone, while useful in saving platform expense in the smaller communities, is not comparable with the improved service that can be obtained with the light-weight safety car, with its more frequent headway and greater average speed.

3. The savings obtainable from one-man cars should be shared with the trainmen in the form of higher hourly rate for the operators of such cars than is paid to the trainmen on two-man cars.

4. When inaugurating one-man car service, it is good policy to assure the trainmen that no one will lose his job due to putting in the new cars. They are installed, as a rule, a line at a time, and experience has proved that the company is not burdened with extra men through this policy.

5. From the nature of the traffic available, the safety cars can accomplish more in a large city than in a small one, for the reason that the possibilities of increasing riding in a small community are limited. This statement is made to correct the erroneous impression existing in some minds that the safety car is useful only for saving expense in the smaller cities.

6. Where traffic is believed to be too heavy on peak to be successfully handled by safety cars, the larger, heavy cars may be used for tripper service on peak, thus making the light cars handle the long hour runs.

7. Similarly, where snowstorms require the use of the heavier equipment at rare intervals, the safety cars can still be used to advantage during other times.

8. The safety car, though light, is just as substantial and with the same care in maintenance should last just as long as the former types of car. It has a steel frame and thoroughly modern, ventilated, interpole motors.

9. Regarding the matter of standardisation, your committee was not unanimous, but the majority opinion favoured adhering to the present standard design of the safety car in the interest of economy.

10. Experience has shown that the overwhelming majority of both riding public and trainmen favour the one-man safety car ; that it can, at one and the same time, improve the public's service, increase the trainmen's wages, and raise the company's profits ; that it can be purchased without financing and operated for about half the cost of an ordinary car ; and that most of the companies that have tried it want more. We predict an increasing rapid extension of the use of a device that can make a showing like the above.

RAILLESS ELECTRIC TRACTION AT SHANGHAI.

Since 1915 the Shanghai Electric Construction Company, Limited, has worked a railless trolley omnibus route over a mile in length. During last year 5¾ million passengers were carried by seven railless vehicles. As many of the busy thoroughfares are too narrow for tramways, the Municipal Council is negotiating with the company for the extension of the railless system, which it is suggested should also be used for goods transport. To meet the increasing traffic requirements, seven new railless cars are being built. The *Indian and Eastern Engineer* recently reported that the average tire mileage obtained from the seven cars in use up to the end of 1918 was as follows :—Front tires, 23,796 miles ; rear tires, 24,960 miles. In addition to the railless system the Council has 16·5 miles of electric tramways, and a fully illustrated account of the undertaking was given in our issue of September 13, 1917.

ADVISORY COMMITTEE ON LONDON TRAFFIC.

The Ministry of Transport have announced that the Advisory Committee on London Traffic has formed a technical sub-committee of 18 members, so constituted that it can be conveniently split up into three sub-committees each consisting of six members, to study and report on London traffic problems, to define the new powers required, and to make recommendations thereon.

The functions assigned to the three sub-committees will be as follows :—

1. Traffic regulations in general and definition of new power required.

2. Improvement of existing forms of street facilities and the provision of new facilities.

3. Passenger traffic in its technical and co-ordinated aspect.

The members of the sub-committees are as follows :—

FIRST SUB-COMMITTEE.

Lieutenant-Colonel C. H. Bressey (Roads Department of the Ministry of Transport), chairman.

Superintendent A. Bassom (Public Carriage Department, Scotland Yard).

Superintendent R. J. Halford (Executive Department, City Police).

Mr. A. Smith (General Secretary, London and Provincial Union of Licensed Vehicle Workers).

Mr. H. E. Blain (Operating Manager Underground Group).

Mr. J. K. Bruce (Traffic Manager, London County Council Tramways).

This sub-committee will consider matters relating to street obstruction and will report on the questions of prescribing maximum and minimum speed limits and of scheduling particular streets for specific purposes. It will consider also whether there should be regular stopping places for all hackney carriages and the formation of queues.

SECOND SUB-COMMITTEE.

Mr. J. S. Killick (Roads Department, Ministry of Transport), chairman.

Mr. A. L. C. Fell (General Manager, London County Council Tramways).

Sir Julian Orde (Secretary, Royal Automobile Club).

Mr. C. R. S. Kirkpatrick (Chief Engineer, Port of London Authority).

Mr. G. A. Dutfield (President, London Cartage and Haulage Contractors' Association).

This committee will examine the existing highway accommodation and report on the possibility of diverting particular classes of traffic from main thoroughfares to parallel streets, the construction of new roads for either omnibus or tramway traffic, and the question of prescribing standard forms of paving and of co-ordinating periodic renewals of road surfaces.

THIRD SUB-COMMITTEE.

Sir Alexander Gibb (Director-General of Civil Engineering, Ministry of Transport), chairman.

Colonel C. Pinkham, M.P. (Chairman of Highways Committee, Middlesex County Council).

Mr. F. Pick (Commercial Manager, Underground Group).

Mr. Rees Jeffreys (late Secretary of the Road Board and Deputy Chairman of the Motor Legislation Committee).

Mr. A. S. Parnwell (Assistant General Manager, G.E. Rly.).

Mr. H. H. Gordon (London County Council).

This committee will decide what should be the proper function of railways, tramways, and omnibuses in the ideal London traffic scheme. It will consider the adequacy of existing facilities and the provision to be made for future traffic developments, the linking up with tramway and omnibus routes, the need of a unification of the tramway systems in Greater London, through running, and better co-ordination of services. It will be asked to recommend specific means of dealing with rush hour traffic.

Mr. J. A. C. Champion (Development Department, Ministry of Transport) is the secretary of the committee.

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THE EDITOR will be glad to consider articles by experts. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, DECEMBER 18, 1919.

Main Line Electrification.

The fact that the North Eastern Railway Company are contemplating the electrification of their main line from York to Newcastle lends additional interest to the presidential address to the Institution of Electrical Engineers by Mr. Roger T. Smith, electrical engineer to the Great Western Railway. Under the ægis and with the assistance where necessary of the Ministry of Transport, we may expect important developments in the application of electric haulage to main line trains. The nearest approach to anything of the kind in this country are the electrified lines of the Lancashire and Yorkshire Railway, which have proved so successful. American experience, too, is encouraging. Mr. Smith, in his address, at once admitted that much heavier trains can be hauled by electric locomotives than by steam, but emphasised in that connection the necessity for stronger draw-gear than at present is necessary on British railways. A large part of his paper was taken up with a detailed comparison of the running costs of steam locomotives with estimated running costs of electric machines to do the same work, the latter figures including capital charges for the electric locomotives and for equipment of track. In this connection, he quoted an estimate of £300,000,000 as the cost of electrifying all the railways in Great Britain, and one of 7,000,000 tons as the annual saving of coal in consequence. Mr. Smith's analysis, as he said, contains various assumptions, but on the basis taken he comes to the conclusion, after allowing for increase of train-miles with electric traction, that the passenger electric locomotive might have difficulty in earning sufficient revenue to meet all present charges and have enough to spare to pay for electricity and for interest on the electrical equipment, while the goods electric locomotive could much more than do so, provided in both cases that electricity is obtained at one halfpenny per kilowatt-hour at the generating station. Mr. Smith, however, pointed out that his generalisation, if applied to an individual case, might be misleading. In any event, main line electrification will include alike passenger, goods, and mineral trains. The president also dealt with the consumption of electricity by railways in this country, and, referring to the electrification of suburban lines, he showed the great advantage of the high load factor which their generating stations enjoy. As an example of the development of suburban passenger traffic brought about by electrification, he cited the case of the London and South Western Railway, where the number of passengers on the suburban lines in 1913 (the last complete steam year) was 25 millions, while in 1918 it was 40 millions. For main line equipment Mr. Smith considers that the high-tension direct-current system must be used, and in this he will doubtless be supported by the majority of electric traction engineers.

A National Electricity Supply.

At the time of writing, the Electricity (Supply) Bill is in the fair way of receiving the Royal assent and so becoming an Act from which the Government expect, and a great many people hope, many blessings will flow. On a cursory glance at the Bill, the reader may not observe very much provision in it for the establishment of that great system of super-power stations of which so much has been heard and from which the whole country is to be abundantly supplied with electric energy for all purposes at very cheap rates. A closer examination of the measure, especially if coupled with a perusal of the

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Parliamentary debates on the Bill, will, however, convince anyone that here we have a great machine provided under State auspices which ought to be capable of carrying out much that is required. The two great provisions of the Bill are the constitution of a body called the Electricity Commissioners, and of a large number of bodies called district electricity boards. The Commissioners are to promote, regulate, and supervise the supply of electricity. They may constitute electricity districts, and in each district all the parties interested are at liberty to prepare a scheme of local administration under a joint electricity authority. If the Commissioners find that no satisfactory scheme is presented, they may set up a district board. In either case the local body formed will consist of representatives of local authorities, companies, and authorised undertakers. It is to be the duty of the joint authority or district board to provide a cheap and abundant supply of electricity, and it is to acquire existing generating stations and main transmission lines, and provide new works of the same sort. Generally, the low-tension local distribution will remain with present distributors, unless taken over by agreement, but the local body will distribute where there are no present distributors. Under agreement, the whole of any existing undertakings may be transferred to the joint authority or district board. There are hosts of details, financial and other, but the above indicates the main idea of the scheme.

Changes in the Bill.

Two fundamental changes were made in the Bill during the prolonged Committee stage, one of which is permanent, while the other was afterwards reversed. The former was brought about at the instance of the Government, who, it appears, had been inundated by remonstrances from municipalities and others. The objection was to the original proposal in the Bill that district electricity boards should be everywhere set up. The local authorities, so many of whom now provide electricity, objected to the business being taken out of their hands and transferred to district boards appointed by the Commissioners. Anticipating a great series of amendments and prolonged discussion in the Standing Committee on the Bill, the Government brought forward new proposals giving the alternative of a joint electricity authority instead of the district board. This alternative, which is outlined above, met the case and harmony—of a kind—reigned. The other sweeping change made by the Committee was to delete a clause transferring to the Ministry of Transport all the powers of the Board of Trade under the Bill, under the Electric Lighting Acts, and under all Orders and special Acts relating to electricity supply. The Government did not put up any fight worth mentioning against this change in the Committee, but when the Bill came before the House of Commons on report, they at once moved the reinstatement of the clause. They showed that it was part of the fundamental policy of reconstruction, co-ordination, and efficiency that electricity supply should be under the Ministry of Transport, that the Board of Trade were incapable of carrying out the great development contemplated, that the Ministry of Transport were capable both from the engineering and the driving force points of view, and that it was absolutely necessary to co-ordinate transport and electricity supply. Otherwise there would be dual authority and inefficiency in all matters relating to electric traction, and some other matters besides. The opposition collapsed, and the clause was reinstated without a division. Speaking generally, it is somewhat remarkable that so large a measure of agreement has been reached on the Bill as a whole, because the conflicting interests of municipalities, electric supply companies, and consumers were fully represented on the Standing Committee. The Government, however, made concessions here and proposed ways out of difficulties there, and it may be said that the Act will have the good wishes of most of those interests which assisted in hammering it into its present shape. In what way exactly tramways will be affected remains to be seen, but it is clear that all municipal power stations will be transferred to district boards or joint authorities to be worked into the general scheme of electric supply. In time tramways should benefit financially by getting power more cheaply. Existing railway, dock, and private generating stations are exempt from transfer, but no new stations can be built except by or with the consent of the electricity authorities. The country will now wait with curiosity to see how the great new plan will work out in practice.

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IMPRESSIONS OF U.S.A. TRAMWAYS.

By W. Tuke Robson.

Writing from New York on November 17, Mr. W. Tuke Robson, formerly general manager of Southampton Corporation Tramways, says :—

I have just returned from a 2,500 mile ten-day trip embracing Chicago, Milwaukee, Detroit, Cleveland, Pittsburg, and Philadelphia, and have pleasure in giving your readers some of my first impressions of American tramways.

While New York is wonderfully dazzling, it is not educational from a transit point of view, and I have seen much better systems further west.

In Chicago, Milwaukee, Detroit, and Philadelphia I found feeling very high regarding fare problems. It would appear that those cities which have been fortunate enough to obtain an increased rate for their services are being hounded by the municipal authorities and the newspapers to such an extent that if they were not Americans, life would be unbearable. One can have no conception of the childish and unreasoning methods which obtain in negotiations between city authorities and street car companies ; vituperative epithets hurled across the table seem to be almost the rule.

Fares Fixed on a Monthly Balance Sheet.

A most welcome relief to this was found, however, at Cleveland, where the street railways are run on the Tayler system—quite the ideal one for this country, I should say. The city authorities practically control the cars, approve schedules, fix fare rates, and in return for these things guarantee a 6 per cent. return to the company. If things are booming and this return is exceeded, fares are reduced for one month ; should the 6 per cent. however, not be attained, the balance is made up from the city funds and fares are put up for the forthcoming month. In fact, a monthly balance sheet is worked out and fares float up or down to suit it. I spent three days in Cleveland, and heard nothing but praise of this street car system and the method of working.

In every other town, except Pittsburg, where the company is in the receiver's hands and beyond the pale, the evening papers were full of floods of abuse and recriminations.

The outstanding joke is, of course, Toledo, and I am very sorry that I did not have time to run over to that city. The company adopted the extraordinary but bold policy of running all the rolling stock into an adjoining state to prevent its seizure by the local authorities.

Fare Collection and Accidents.

In the matter of fare collection, one is instantly struck by the efficiency arrived at, through having standard coins and the conductor always at his post—with the exception of Chicago where large open platforms are used, and the conductor collects the money without using a fare-box. In other cities I should think a very small percentage indeed is lost in missed fares or fraud (either by conductors or passengers).

Again, the presence of the conductor at the alighting platform with air-operated vestibule doors must be a great preventive of platform accidents. On inquiry, I found this was so, but this result is apparently counteracted by heavy accident claims (bogus or otherwise) mainly through collisions and sudden stoppages. Out of these "accidents" a certain type of lawyer makes an excellent living through the possession of a special qualification in appealing to the imagination of the jury.

I must confess, however, that I have longed several times for our open English platforms. At Milwaukee on a rainy evening I made three attempts to board a car, and each time found an air-operated door slammed in my face and the step of the car vanishing into thin air when I had one foot almost on it. There is something to be said for both practices.

Condition of Tracks—Welded Rails.

The most surprising thing I found here is the appalling condition of the track paving. While the rails are in very good order, the majority being of very heavy section, 130 lb. and upwards, the paving is too awful for words. I have seen craters more like shell holes than streets, and it is no uncommon thing to find depressions along the sides of the rails 12 in. in depth. As a species of brick is used for paving instead of granite or wood, this is not surprising.

Thermit-welded rails are pretty universal, but electric welding for repair purposes has not reached anything like the standard of English practice. The excuse they give is that practically every undertaking is in a serious financial condition and afraid to spend money even on a welding plant.

Safety Cars—Inadequate Motors—Absence of Trolley Fouling.

I have been very much impressed by two types of cars, the Peter Witt and the Birney Safety Car, but as this commonsense, clever system of operation is a big subject, I will leave it for a future article.

The repair shops are exceedingly well equipped with splendid machine tools, and I have already seen two sand-blasting plants where the whole car is put into a shed and sand-blasted all over before re-painting. They do, however, stick to old equipments in a surprising way. I have seen a row of 100 broken armature shafts, and ring lubrication for traction motors is unknown. One would certainly have expected to find the old 25-H.P. motor thrown out long ago, but I think there are more of these than anything else.

One of the best features is the entire absence of trolley fouling, due, as far as I can see, to centre running, the absence of a heavy trolley head, and the use of a large diameter wheel. Trolley catchers are universally used, but I have never seen one operate yet, as I have never seen the least indication of trouble through trolleys leaving the wire.

High tension bells and buzzers are being universally adopted, and will no doubt be taken up in England, owing to their great simplicity and effectiveness.

High Speed with Low Step Cars.

The hospitality one meets with is wonderful. Every system I have visited has been thrown entirely open to me, and an automobile placed at my disposal in each case. The street railway men are very much interested in English operation. It is noticeable, especially in view of the long reign of the single-deck car, that the recent introduction of double-decked omnibuses in Chicago and New York has created quite strong press agitation for more open top riding facilities. Mankind is never satisfied.

The high speeds made possible by step-less or low-step cars (Cleveland averages 11 miles per hour), together with efficient fare collection, and the almost entire absence of platform accidents, is enough to make an English tramwayman's mouth water.

The Problem of Saturation.

With the exception of a few who are fortunate enough to have been able to raise fares, street railway companies are in a sad financial state, and it is deplorable to see to what depths they have to stoop to jockey up the public into agreeing to pay a higher fare. New York is at present plastered with appealing notices. Example : A picture of an empty-pocket investor looking

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down at a money box, made like a street car with a hole in the bottom, saying piteously, "Why did I do it?"

The Broadway cars run almost empty, as owing to absolute saturation one can walk faster. Most of the big cities have reached saturation point, and I was shown at Cleveland a most interesting and colossal rapid transit scheme, whereby all cars will be taken under the centre of the city to a vast terminal, which will house railways and street cars underneath, and automobiles on the surface, thereby reducing travelling time to suburbs from 45 minutes to 15 minutes.

Five-Cent Fare Troubles

Zone fares are going badly. Milwaukee started off with a bang, which was promptly followed by a Railway Commission veto. New Jersey is fighting zone battles daily, and there is no doubt that the universal education up to the five-cent fare has made it very difficult indeed to produce any other point of view.

The short-distance passenger has never been catered for at all, and one can only stand and wonder at such a great nation insisting that, no matter how many more miles may be added to a route, the same five-cent fare must be maintained. To run, as many of them do, 20 or 30 miles for five cents, is as unbusinesslike and absurd as anything one can imagine.

I have not touched on the inter-urban and rapid transit lines, which are really wonderful, but will reserve reference to these also for a future occasion.

ELECTRIC TRACTION LEGISLATION.

The time of the war saw a complete cessation of the promotion of bills for the construction of electric tramways, but now there is a prospect of matters in this respect returning to former conditions. Down to the end of November, when the time expired for giving notice of private bills to be promoted in the next session of Parliament, no fewer than 28 notices were given of tramway bills, three of tramway provisional orders, seven of light railway orders, and four of electric railway bills for England and Wales.

The following indicates the general purposes which are proposed—

Tramway Bills.

Blackpool Corporation.—To authorise the construction of tramways and tramroads, carriage of goods and minerals on tramways, and running of motor omnibuses.—Agents: Sharpe, Pritchard and Company.

Bristol Corporation.—To enable the Corporation to construct a new tramroad.—Agents: Dyson, Bell and Company.

Cardiff Corporation.—To carry out tramway extensions and to run trailer cars and motor omnibuses.—Agents: Dyson, Bell and Company.

Coventry Corporation.—To extend the tramway system and to run motor omnibuses.—Agents: Sharpe, Pritchard and Company.

Erith Urban District Council.—To confer additional powers in regard to tramways and to run motor omnibuses.—Agents: Sharpe, Pritchard and Company.

Halifax Corporation.—To extend the tramway system in Halifax and neighbouring districts, to change the gauge of the tramways, and to increase fares.—Agents: Lewin, Gregory, and Anderson.

Hastings Tramways Company.—Authority is sought to work a certain tramway by the overhead trolley system.—Agents: Rees and Freres.

Huddersfield Corporation.—To extend the tramways, increase fares, and run motor omnibuses.—Agents: Sharpe, Pritchard, and Company.

London County Council Tramways.—To extend the tramway system and to work motor omnibuses.—Agents: Sherwood and Company.

Metropolitan Electric Tramways Company.—To increase fares, extend the time for the completion of authorised tramways, and to use trailer cars.—Agents: Dyson, Bell, and Company.

London United Tramways Company.—To increase fares and to authorise a junction at Acton with the Middlesex tramways.—Agents: Dyson, Bell and Company.

Lowestoft Corporation.—To authorise the provision of a railless traction services and to make alterations as to fares.—Agents: Sharpe, Pritchard, and Company.

Manchester Corporation.—Tramway extension, and extension of time for completion of authorised lines.—Agents: Sharpe, Pritchard and Company.

Middlesex County Council.—To authorise the construction of tramways in Willesden and Kilburn, and to confirm agreements with the London County Council and the North Metropolitan Power Supply Company.—Agents: Dyson, Bell and Company.

Newcastle-on-Tyne Corporation.—To extend the tramways, to acquire the Tyneside tramway system, and to run motor omnibuses.—Agents: Dyson, Bell and Company.

Nottingham Corporation.—To authorise additional tramways and to work motor omnibuses.—Agents: Sharpe, Pritchard and Company.

Pontypridd Urban District Council.—Power is sought to extend the tramways and to increase fares.—Agents: Sharpe, Pritchard and Company.

Portsmouth Corporation.—To authorise the construction of additional tramways.—Agents: Sherwood and Company.

Rhondda Urban District Council.—To extend the time for the completion of authorised lines, and to increase maximum fares.—Agents: Torr, Durnford and Company.

St. Annes-on-the-Sea Urban District Council.—To enable the Council to acquire the Blackpool, St. Annes, and Lytham Tramway Company's undertaking, and to authorise arrangements with Lytham Council for working the undertaking. New tramways are also proposed in Lytham, and authority is sought to use trailer cars and to obtain running powers over the Blackpool tramways, and to use motor omnibuses.—Agents: Lees and Company.

Salford Corporation.—This includes provision for tramway extensions and for the use of motor omnibuses.—Agents: Dyson, Bell and Company.

Sheffield Corporation.—To enable the Council to construct new tramways and tramroads, and to run motor omnibuses.—Agents: Sherwood and Company.

Southampton Corporation.—This also proposes tramway extensions and power to run omnibuses outside the borough.—Agents: Sharpe, Pritchard and Company.

South Metropolitan Electric Tramways Company.—To increase fares, use trailer cars, and construct junction lines.—Agents: Dyson, Bell and Company.

Stoke-on-Trent Corporation.—To authorise the purchase and working of the undertakings of the Potteries Electric Traction Company and the North Staffordshire Tramways Company.—Agents: Torr, Durnford and Company.

Tyneside Tramways and Tramroads Company.—To alter maximum fares, to run omnibuses, and to regulate borrowing powers.—Agents: Torr, Durnford and Company.

Wallasey Corporation.—To increase maximum fares.—Agents: Sharpe, Pritchard and Company.

Wrexham and District Transport Company.—To authorise increase of charges.—Agents: Sherwood and Company.

Tramway Provisional Orders.

Gravesend and Northfleet Electric Tramways Company.—To increase fares.—Solicitor: Sydney Morse.

Sheffield Corporation.—To authorise new tramways and to increase fares.—Agents: Sherwood and Company.

Warrington Corporation.—To authorise extensions of the tramway undertaking.—Agents: Sharpe, Pritchard and Company.

Light Railway Provisional Orders.

Brighton Corporation.—To authorise an extension to Patcham.—Agents: Rees and Freres.

Ely to Methwold (Fen District).—To authorise a company to construct a light railway between the places mentioned.—Agents: Baker and Sons.

Middleton Electric Traction Company.—To authorise increased fares.—Solicitor: Sydney Morse.

Peterborough Electric Traction Company.—This also seeks power to increase fares.—Solicitor: Sydney Morse.

Sand Hutton (Yorkshire).—To authorise certain promoters to construct a light railway.—Solicitors: Crist, Todd, Mills and Sons, Beverley.

Southend-on-Sea Corporation.—To construct an additional light railway.—Agents: Sharpe, Pritchard and Company.

Yorkshire (Woollen District) Electric Tramways Company.—To enable the company to increase fares.—Solicitor: Sydney Morse.

Electric Railway Bills.

Central London and Metropolitan District Railway Companies.—To authorise the construction of a new line joining the Central London Railway at Uxbridge Road with the London and South-Western Railway Company's Kensington and Richmond branch at Shepherd's Bush; running powers are sought for the Central London Railway Company over the Kensington and Richmond branch. It is also sought to improve Aldgate East station.—Agents: Bircham and Company.

Derwent Valley, Calver, and Bakewell Railway Company.—To enable the company to construct a railway, with power to work it electrically.—Agents: Dyson, Bell and Company.

London Underground Electric Railway Company.—To increase fares.—Agents: Bircham and Company.

Mersey Railway Company.—To extend the time for payment of interest on debentures and to make arrangements for allowances for depreciation.—Agent: John Kennedy, W.S.

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SCOTTISH PROPOSALS.

Under the Scottish Private Legislation Procedure Act, all private legislative proposals from Scotland have to be in the first instance brought as applications to the Secretary for Scotland for Provisional Orders. Subsequently the chairmen of the two Houses of Parliament decide whether any of the proposals are of such importance that they should be dealt with as private bills. In the majority of cases the decision on that point is in the negative, and local inquiry takes the place of Parliamentary inquiry, and when the Orders are passed by a Commission they are formally confirmed by Parliament. For next session there are five applications from Scotland relating to tramways, namely :—

AIRDRIE AND COATBRIDGE TRAMWAYS.—To authorise increase of fares.—Solicitor : Sydney Morse.

DUNDEE CORPORATION.—To provide for through running between the tramways of the Corporation and those of the Dundee, Broughty Ferry, and District Tramways Company.—Agents : William Robertson and Company.

DUNFERMLINE AND DISTRICT TRAMWAYS.—To extend the time for the completion of authorised lines, and to authorise increase of fares.—Agent : John Kennedy, W.S.

EDINBURGH BOUNDARIES EXTENSION AND TRAMWAYS.—To construct additional tramways, to extend the time for the completion of authorised lines, and to run motor omnibuses beyond the burgh boundary.—Agents : Beveridge and Company.

GLASGOW CORPORATION.—To extend the time for the completion of authorised tramways.—Agents : Martin and Company.

RURAL TRANSPORT (SCOTLAND) COMMITTEE

REPORT AND RECOMMENDATIONS.

The report and recommendations of the Rural Transport (Scotland) Committee, which was issued in July last, are of considerable interest. The Committee was appointed in February, 1918, by the Secretary for Scotland to consider and report upon :—

(*a*) The rural areas in Scotland which are most in need of transport facilities for the promotion of agriculture, forestry, and other rural industries ; (*b*) the means of improving communication in these areas, with special reference to new or improved roads, light and narrow gauge railways, and motor transport, including any consequential modification of existing steamer services.

As the result of communications from County Councils and District Committees, the managers of the Scottish railway companies and the Scottish Agricultural Organisation Society and the Scottish Smallholders' Organisation, Limited, it was decided to divide the country into three districts, viz., north-western, eastern, and southern, and to appoint a sub-committee of our members in respect of each district to inquire into and to report on the needs of the district, and the best means of meeting these needs. Personal visits were made by the members of the sub-committees to the areas within their districts which were reported to be in need of improved transport facilities for the development of their agricultural, fishing, sylvicultural, and other rural resources. Conferences were held at those places with the exponents of local opinion, with whom the various proposals for improving the means of communication were fully and freely discussed. The ground was carefully gone over, and the problem presented in each case was considered from the economic and engineering standpoints. In January, 1919, a sub-committee visited France for the purpose of examining and reporting on the permanent way material and rolling stock used by the British Expeditionary Force, which might be available for carrying out the recommendations of the committee relating to light railways.

With respect to railways, the report states that Scotland does not compare favourably with other small maritime countries as regards mileage of railway in proportion to population.

For the purpose of developing agriculture and rural industries generally, the only possible railways are what are termed "light railways." There are no narrow gauge lines in Scotland connecting with a standard gauge line. The only lines of narrow gauge are the Glasgow District Subway, which is a circular underground city line with no connections (gauge, 4 ft.), and the isolated Campbeltown and Machrihanish Light Railway (gauge, 2 ft. 3 in.). In Ireland numerous experiments have been made in the construction of narrow gauge railways, with, on the whole, rather unfavourable results ; but it must be remembered that in that country the standard gauge is 5 ft. 3 in. Even there the concensus of opinion now is that any extension should be constructed on the standard gauge.

The Committee recommend that where a proposed railway has physical connection with an existing line it should be of standard gauge, while in cases where such connection is impossible or highly improbable, as, for instance, in that of a railway on an island where there is no question of a train ferry, a narrow gauge line is recommended. A narrow gauge line is appropriate in the islands, and in the special case of the Loch Eck scheme, where physical connection with a standard gauge system is impossible. For such lines they would prefer that the gauge should be 2 ft. 6 in., but since permanent way material and rolling stock of 60 cm. (1 ft. 11¾ in.) may be available from France, this material could be used in these districts. The other lines recommended should be light railways of standard gauge, being too short to form efficient narrow gauge units. Several are intended to deal with the fish traffic, others with the milk traffic, and in these circumstances it is necessary to avoid the delay in transhipments through a break of gauge. In the cases of the recommendations of new lines from Turriff Station to Maud Junction in Aberdeenshire and in the Glenkens district of Kirkcudbrightshire, such lines would connect two standard gauge railways, and in the latter instance would afford an advantageous through route. Therefore to attain the objects in view the standard gauge would be required.

Railways of both gauges should be constructed as cheaply as is consistent with efficiency. Where possible the track should be laid alongside an existing highway. The trains should be run at a low speed, and in most cases the line would be unfenced. The rolling stock should be adapted to passengers entering the carriages from the ends and at the level of the rails, so that raised platforms would not be required. Fares would be collected *en route*, thereby dispensing with booking offices. Instead of stations there would be "halts" or stopping-places without buildings, save where sheds were needed for the reception of goods awaiting delivery or despatch. It is recommended that in all cases, with the exception of the proposed line to Lochinver, these rural railways should be worked by one locomotive in steam, and thus avoid the cost of signalling. Rails would be spiked to the sleepers, thereby saving the expense of chairs.

MOTOR TRANSPORT.

Motor transport also needs some definition. The vehicles employed include the light motor car carrying mails, the comparatively heavy mail coach, and the heavy lorry with solid rubber or steel tires. Both the size and the type of vehicle are important in reference to the local traffic and to the damage it does to the roads.

Motor transport for goods is possessed of a high degree of flexibility. The lorry can call at farms lying off the main road, whereas in the case of goods carried by a railway through an agricultural district the majority of the farmers would have to cart them for appreciable distances. Not only is a motor service for goods characterised by great flexibility, but also when the roads are good (as is usually the case of the Lowlands, and in many of the dales and in some of the straths) it is the natural pioneer of the railway. If motor traction be regarded as supplementary to the railway system of the country, the rates charged for that service should be uniform with railway rates. A district that was being developed would not suffer in the initial stages through the high rates it would be necessary otherwise to charge during the time traffic was being built up if it had to rely on an independent motor service. At the root of the demand for railway construction there is often the comparison between fixed railway rates and higher motor rates in the particular district. The element of hardship in such cases would be met by a system of standard motor rates, which should be not higher than railway rates for comparatively short distances when the cost of cartage to and from the railway is taken into account.

While this adjustment would to some extent meet the needs of the case, it is not overlooked that motor services would impose an increased strain on the roads, the efficiency of which varies greatly in different districts. In many cases in the Lowlands the roads generally are good, and, apart from minor improvements, such as easing relatively sharp turns and strengthening bridges, are capable of carrying the new traffic. No doubt this would involve increased charges for maintenance, and this point has been taken into account by the Convener's Committee of the county of Roxburgh in deciding in favour of this form of traction as against an extensive system of light railways in that county. We quote the following extract from the Committee's memorandum :—"With the exception of the new railway above indicated, the Committee are of opinion that rural transport would be possibly better developed in the county by means of an increased number of motor and steam lorries and tractors, which have the great advantage over railways that they minimise the hauling of goods from the farm to the station and *vice versa*. . . . The Committee are aware that much additional wear and tear of the roads would take place, but they regard this as inevitable and probably not more expensive to the rates than would be the burden of an extensive light railway system."

Motor and steam lorry traffic has already developed in a number of districts, and may be expected to develop in others, to an extent which would impose a considerable burden for wear and tear of roads, yet without reaching such volume as would justify the construction of a railway. In such cases the Committee are of opinion that relief may be found in the construction of concrete wheel tracks laid on or by the side of the existing roads. A bye-law may be necessary to make it obligatory on motor drivers to use these tracks in preference to the macadamised road, and to prohibit drivers of horse vehicles from using them. The concrete tracks should be laid flush with the surface of the existing road so as to permit of a vehicle turning off the track on to the macadamised road to allow another vehicle to pass. In addition to relieving the existing road of its most destructive traffic, such tracks would lessen the wear and tear of tires, and decrease the resistance to

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traction as compared with the ordinary road surface. We recommend that a stretch of road at some suitable centre, easily accessible and connecting with a main railway line, should be laid with an experimental concrete wheel track on which tests could be carried out.

Combined Land and Water Transport.

In the Lowlands, and in the straths, glens, or dales, the problem of transport consists in filling in gaps in an existing system. Except in so far as waterways may be used, it is altogether a matter of rail and motor transport. In the western coastal region and the islands there is a further element of combining these with the service of steamers and motor boats. Moreover, in many respects the communications of these latter areas together form a transport system in themselves, even though the railway lines which serve them are connected with the general railway system of the country. Motor transport occupies the position of securing rapid mail, passenger, and parcel services for communities which cannot be provided for otherwise.

Conditions Affecting the Committee's Recommendations.

Apart from matters of detail, the following were the type of considerations which influenced the Committee in forming a decision. A railway appeared desirable :—

(1) When it appeared that motor traction had already been pushed as far as possible, and that there could be definite further development if better transport facilities were provided, as, for instance, in the Strathdon and Rhinns of Galloway districts. In this connection the experience of the Great North of Scotland Railway Company, which for some years has been using motor traction as feeders to its system, is of interest, namely, that " while these motor omnibus and steam lorry services have improved the means of transport, they do not allow of the traffic being fully developed, and probably have only postponed the demand for railways."

(2) Where a large seasonal traffic, such as that in fresh fish from the Minch, is possible, which cannot be handled efficiently by motor or by the existing railway services.

(3) Where a railway is a possible link in a chain of communication extending beyond it by land or sea, and would hasten the delivery of mails and the journeys of passengers throughout a large district. Cases in point are the proposed line in Skye, and the possible shortening of the sea passage from the mainland to Stornoway. There are also a few instances in which railways appear desirable to link up existing lines, as, for instance, the proposed line between Turriff and Maud Junction and in the Glenkens district.

(4) Where, as in Wester Ross and Sutherland, the maintenance of existing roads carrying heavy motor traffic is too costly to be borne by the local authority.

In this way traffic by land which requires development comes to be graduated. There are :—

(*a*) The village or rural district which requires to be connected with a railway station or market town, and in some of these cases one motor might serve several such communities.

(*b*) The large rural district, extending in some cases over the length of a valley, which requires the service of one or more motors daily for goods traffic, with a passenger service in addition.

(*c*) The more closely settled district, the industrial needs or higher degree of cultivation of which require the daily service of several heavy motors on the same roads. If there is doubt as to a railway being able to meet its expenses in such a district, there may be a case for the provision of the concrete wheel tracks described above.

(*d*) A railway follows either when the traffic becomes more dense or when one or more of the considerations described in the preceding paragraph become prominent.

Finance.

In considering the finance of the proposals three main questions arise :—

(*a*) How far should or must the various sets of services recommended be considered—with respect to their possible remunerativeness—together with the existing transport system of the country ?

(*b*) How far should financial considerations determine the choice of methods of providing communication ?

(*c*) How far should deficits on the working of schemes be made good from (i.) central, (ii.) local funds ?

These questions cannot be altogether separated for the purposes of discussion.

After dealing with each of the above points, the report proceeds :—

Taking the railways as a whole, we are satisfied that the capital cost will have to be met from public funds, and that in most cases not more than a return sufficient to cover working expenses can be looked for. The position, however, is put in a different light if we look on the whole system of transport in the country as unified and managed on the same principles as those on which the postal service is conducted. Then the provisions of railways for agricultural districts will take its place as making good a defect in the whole system as it has been handed on to us from an earlier generation.

The question of contributions from local authorities arises in regard to motor services for which county roads have to be improved and maintained at the improved standard, and in regard to railways the construction of which will relieve the roads of heavy motor traffic. In the latter case the local contribution should be rather towards meeting any deficit in working expenses than towards meeting capital cost. The Committee do not wish to press the application of this principle in the case of some Highland counties in which the roads are quite unfit for such heavy motor traffic as at present is borne on them. With regard to any deficit in working, the principle of local contribution to make good part of the deficiency may justly be adopted in the form of assessment up to a certain limited rate. The local authorities who are now finding the upkeep of the highways a grievous burden will obtain a considerable relief ; they will at the same time profit by the increase of assessable values as rural resources undergo development, and the districts affected will enjoy the benefit of a cheaper form of transport. It is to be hoped, too, that the responsibility of a district for part of any deficiency on working expenses would act as an incentive to make full use of the better transport facilities, and would give the people an interest in raising the traffic to the paying point. It is not recommended that the rate to be levied should be uniform in all districts, but that in fixing it the varying circumstances of the districts should be considered, and discrimination made between districts where the assessable value is high and existing rates are low, and those in which the converse obtains.

Administration of Improved Transport Services.

The second report of the Select Committee on Transport and the Bill for the establishment of a Ministry of Ways and Communications aims at a unification of the transport agencies of the kingdom. Under such a system it is necessary that there should be a separate body charged with the control of ways and communications in Scotland. The functions of the Scottish Department of Ways and Communications which are suggested by the Committee's study of the conditions would include such a control of railways as would ensure that the extensions recommended should be constructed, worked, and maintained efficiently. It must be recognised, however, that this would still leave great tracts of country and a considerable population dependent on other means of communication. In some cases these must be by sea, in others a considerable increase in motor traction will be required. Each of these will require somewhat different treatment. The steamer service of Messrs. David MacBrayne, Limited, should be taken over by the State upon equitable terms, and that this undertaking, as well as the new mail steamer services recommended, should be administered by the authority which we suggest.

The department would also be charged with organising, and, where necessary, maintaining motor transport services. It is only by such control that the full development of rural industry can be achieved. An essential element in the use of transport for purposes of such development in the case of Scotland will be unification of control, so that those persons who must depend upon motor services, or motor services and steamer services combined, should have the same advantages in respect of rates and fares as will be enjoyed by others who are able to use a railway. In the case of motor services the proposed department should be authorised either to undertake such services, or to authorise private persons to undertake them, always subject to the control of the department as to rates, fares, and other conditions.

Details of Proposed Schemes and Recommendations.

Thirty-one pages of the report are occupied with details of the proposals made for the improvement of means of transport in the districts visited, and a statement of our recommendations in each case. Two maps are included. The majority of the recommendations relate to railways, the remainder to road, motor, and steamer services and road improvements.

Adverting to the Great North of Scotland Railway, within the counties of Aberdeen, Banff, and Elgin, attention is drawn to the company's endeavour to supplement the railways with road motor services. The fleet of omnibuses numbers 33, and the capital expended on this branch of business, including sheds and dwelling houses for staff, amounts to £29,161. The company also provides for the transport of goods by a number of steam lorries in extension of their railway, and in districts where there are no railways. During the seasons when manures and coal are being taken out to rural districts and grain is coming in the company send lorries to ply to and from central stations. The company possess eight of these steam lorries, with three more on order, and the amount of capital expended on them is £4,736. It is the view of the company that while the omnibus and lorry services have improved the means of transport, they do not allow of the traffic being fully developed, and probably have only postponed the demand for railways.

There is a reference to the heavy motor omnibus and mail services which are at present wearing out the Ross and Sutherland roads, for which it is proposed to substitute light railways and steamers.

A report dealing with the visit of a sub-committee to examine the permanent way and rolling stock used in France by the British Expeditionary Force is given elsewhere in this issue.

The 18 schemes of railways recommended have a mileage of 382, of which 226 is for standard gauge. Fourteen road motor services with a total mileage of 244½ are advised, and nine schemes for new steamer or motor boat services.

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BRITISH LIGHT RAILWAYS IN FRANCE.

REPORT OF A SCOTTISH TRANSPORT COMMITTEE.

Appended is the report of a sub-committee of the Rural Transport (Scotland) Committee who were appointed to visit France and examine the permanent way material and rolling stock used by the British Expeditionary Force. The sub-committee comprised Messrs. J. Ferguson, M.Inst.C.E., and W. A. Tait, M.Inst.C.E.

In accordance with the remit from the committee at its meeting in Edinburgh on January 13, 1919, we proceeded to France early in February for the purpose of examining the railway materials and rolling stock, more particularly relating to light railway construction, which may be available for the purpose of carrying out the recommendations of the committee.

We were taken to the headquarters of Major-General Crookshank, D.G.T., who, after discussing a number of points with us, detached General Reynolds (late chief engineer to the Central Argentine Railway), Director of Light Railways, to supply such information as we required. General Reynolds described generally the system of railways laid down by the British Expeditionary Force. These consist of main trunk lines of standard gauge (4 ft. 8½ in.), with which are connected an extensive network of feeder lines of 60 cm. gauge (1 ft. 11½ in.) to serve the forward areas and lateral connections for cross-country traffic of the armies. The main trunk lines are laid with 75 lb. F.B. rails, and the feeder lines of 60 cm. gauge with 20 lb. rails. About 2,500 miles of main traffic lines have been laid down, and about 2,400 miles of feeder lines.

The narrow-gauge feeder lines have carried a large amount of traffic and have apparently been most efficiently worked. They are worked by means of locomotives of various types, and, in the opinion of General Reynolds, the most successful type has been that manufactured by the American Loco. Company. This type is said to be very flexible, and therefore less destructive of the permanent way. On the other hand, Colonel Pickard, who has been in charge of the operating of these narrow-gauge lines, is of opinion that the best work has been got out of the Hunslet side tank loco., manufactured by the Hunslet Engine Company, of Leeds. These locomotives are capable of hauling a gross load of about 135 tons or net load of, say, 90 tons on a 1 per cent. gradient, i.e., a gradient of 1 in 100. Translating such results into equivalent work on such gradients as may be expected in Scotland, namely 1 in 50, the locomotive would be capable of hauling a gross load of about 60 tons. The minimum curve adopted on these railways is 160 ft. radius for running lines, and 30 metres or 100 ft. radius for sidings.

General Reynolds mentioned the interesting fact that it took 2,200 men a day to lay and ballast complete 1 mile of narrow-gauge track. The operating speed averages 5 or 6 miles an hour, depending on the state of the track, but in France there are similar narrow-gauge lines where the running speed averages 12 miles per hour, including stoppages.

We were informed that there are 200 miles of unused narrow-gauge railway material, complete with the necessary fastenings, in France, and about 250 miles of the same material in stock at different places in Great Britain. On the general question of the economy of the use of rails weighing 20 lb. per yard, both General Reynolds and Colonel Pickard indicated their opinion that it would be of great advantage to use a rail of heavier section, preferably 30 lb. per yard. In this we unhesitatingly concur. The rail section of 20 lb., which is abnormally light for a permanent line, was apparently adopted from the French lead in this matter, and was in all probability decided upon by reason of the difficulty in obtaining steel. A rail section so light as 20 lb. per yard involves a greatly increased cost of maintenance over a rail of, say, 30 or 40 lb. per yard. It not only limits the permissible loading, but soon becomes crippled.

As regards locomotives and rolling stock, we visited, along with Colonel Pickard, the chief locomotive shops and repair works situated at Beaurainville, and were shown over the works by Captain Paterson, R.E., the works manager. These very extensive and well-arranged shops have been laid down since April, 1918, and now employ over 1,000 men, chiefly German prisoners of war. Everything connected with the repair and maintenance of the locomotives and rolling stock is carried out at these works. We saw a number of narrow-gauge locomotives captured from the Germans after being purposely damaged by them. These locomotives have all been overhauled at Beaurainville and put in running order.

The traffic on the narrow-gauge lines having now been reduced, the staff at Beaurainville were largely employed in overhauling and putting in thorough running order various locomotives withdrawn from service so as to make them available for use elsewhere. The number of these, and the various types, on the day of our visit were as follows :—

Name.			Number.
Baldwins ...	... ...	4–6–0	300
Hunslet ...	... ...	4–6–0	50
Americans	... ...	2–6–2	50
Barclays ...	... ...	0–6–0	25
Hudsons ...	... ...	0–6–0	25

These had all been tested under steam and passed as ready for the road.

At a later date we visited the area of recent operations of the armies for the purpose of examining various sections of the narrow-gauge lines and the methods of dealing with transhipment between the standard and narrow-gauge system.

North of Arras, on the Vimy Ridge, we examined one of the principal transhipment stations at Ecurie. This station has been laid out to deal with a large traffic. There was only one short length of loading-bank capable of being used for side and end loading.

The general " lay-out " of the yard consists of lengths of standard-gauge sidings into which the train of wagons is run, and there are duplicate narrow-gauge sidings laid alongside of and parallel to the standard gauge. The narrow-gauge siding nearest the standard gauge is divided into train lengths to suit the shorter lengths of train worked on the narrow-gauge lines by putting in cross-overs to the outer narrow-gauge line, which is used as the running line, and the traffic is pulled out at the opposite end of the yard from the point of entry.

DIRECT TRANSHIPMENT.

Generally the transhipment arrangements conform to a plan of this kind, but in instances alterations have been made to suit local or special circumstances. The rail levels of both narrow and standard-guage lines are the same. There are no special facilities provided for the actual handling of materials in transhipment. From Ecurie we proceeded to Barlin, the headquarters of Colonel Wilson, Assistant Director of Light Railways with the First Army. A small depot and travelling workshops capable of carrying out all running repairs is established at this place. More extensive repairs are carried out at Beaurainville, already referred to. At the depot at Barlin we examined practically all types of open and covered wagons used on these lines.

Thereafter we travelled by special train over a 5-mile length of 60 cm. gauge railway from Barlin to Bethune. This section is laid partly with 20 lb. rails and partly with 45 lb. rails. It was observed that the portion laid with the heavier rails was in much better alignment, and we were informed that it required much less maintenance than the portion laid with 20 lb. rails.

From careful inspection of these sections we are confirmed in our opinion that a rail of 20 lb. section is too light for the locomotives and rolling stock in use. The use of such light rails was in all probability justified by the special circumstances of the war, but is not in our opinion (and this is shared by all the competent authorities we have been associated with in our visit) a commercial proposition. Had it been possible to secure a 30 lb. section returnable from France we should unhesitatingly have recommended this, and, failing this, we recommend that such isolated narrow-gauge lines as the committee have in view should be laid with 45 lb. rails on a gauge of 60 cm.

The locomotives in use on the 60 cm. lines are admirably suited to our purposes in working the lines in the islands, and a judicious selection may be made of the various types of open and covered wagons for the same purpose.

The covered wagons would readily be converted into passenger cars, providing a seating capacity for 20. The seats would be arranged along each side of the coach, leaving a passage down the centre longitudinally for the conductor to collect fares in the same manner as in tramway working.

While the running lines, should we think, be laid with 45 lb. rails, the sidings and short branches might be laid with 20 lb. rails, and thus effect some saving in first cost. The adoption of the heavier rail will undoubtedly effect economy in maintenance, and have the further advantage of minimising the risk of derailment of vehicles.

On February 6 we had an interview with Colonel Lyell, Director of the Main Trunk Lines, who gave us information regarding the 75 lb. rail track which has been extensively used for the standard-gauge traffic. Later on we saw Colonel Lyell's deputy—Lieut.-Col. Mount—who supplemented the information already received regarding the heavier section rails with details regarding the fastenings and construction. Lieut.-Col. Mount is of opinion that a 75 lb. rail is too light for the axle load and intensity of traffic on the lines in France, and would have preferred 80 or 90 lb. rails ; but we are of opinion that this section, which is flat-bottomed and consequently does not require chairs, is well suited to meet the requirements of the lines proposed to be recommended by the committee as extensions of existing standard-gauge lines. These rails are of the British Standard section, which has been largely used in India.

We are informed that at the present date there are unused materials in France sufficient to construct 239 miles of 75 lb. rails, single track, and an additional quantity of 200 miles in Great Britain. This is, of course, over and above the 2,500 miles of single track of standard gauge which has been laid down. The committee's recommendations embrace approximately 226 miles of railway of standard gauge, or little more than one-half of the material available, so that it now appears our whole recommendations could be met by using new material in stock at home and in France.

Nothing is known by the principal officers whom we interviewed (either at the War Office or in France) as to the Government policy

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regarding the disposal of the permanent way materials, but there is a strong feeling that the French Government are anxious to acquire them in their entirety at the lowest possible price. Such price would no doubt have regard to the post-war price of new materials of the same class, and be subject to deduction in respect of depreciation and, it may be, the cost of lifting and removing the materials from the present tracks. This latter item is estimated approximately at £400 per mile.

In view of the possibility of such an arrangement being entered into, it would seem prudent to set aside for the Government's own use and exclude from sale such quantities of railway materials and locomotives and rolling stock as are required to meet such recommendations of the committee as the Government may adopt.

The report also referred to the inland water transport, and mentioned that the Government had on hand for immediate disposal a very large fleet of the latest types of small craft of such size as the committee have in view to meet their recommendations as to local coastal service in the West Highlands, and accordingly it seemed appropriate that the attention of the Secretary for Scotland should be directed to the subject in order that the necessary steps should be taken to further consider the matter.

TRAMWAY CHAIRMEN FOR 1919-20.

Municipal Tramways Committees have now been appointed for the ensuing year, and we append a list of the chairmen and vice-chairmen. New appointments are indicated in the list by an asterisk.

Town.	Chairman.	Vice-chairman.
Aberdare	Coun. E. Stonelake ...	
Aberdeen	*Coun. D. W. Beaton...	
Accrington ...	Ald. T. E. Higham ...	*Coun. F. Lord
Ashton-under-Lyne	Ald. R. S. Oldham ...	Ald. C. H. Waterhouse
Ayr	Bailie J. R. Learmont	Bailie T. Murray
Bacup	*Coun. S. McLerie ...	Coun. J. H. Lord
Barking	*Coun. Whiting	
Batley	Coun. F. W. H. Auty	Coun. J. E. Oldroyd
Bexley	*Coun. F. Leonard ...	
Birkenhead ...	Coun. H. Halsall ...	*Coun. F. Tutty
Birmingham ...	Coun. Lee	
Blackburn	Ald. W. Thompson ...	Coun. C. Higham
Blackpool	Coun. Brooks	*Coun. Lumb
Bolton	*Coun. Horrocks ...	*Coun. P. Higson
Bootle...	Alderman Booth ...	*Coun. Ashton
Bournemouth ...	Coun. F. J. Bell... ...	*Coun. J. Wilson
Brighton	*Coun. G. E. Deighton	
Burnley	Coun. E. Heap	Coun. Irving
Burton-on-Trent	Ald. J. S. Rowland ...	Ald. T. E. Lowe
Bury	Ald. T. S. Collinge ...	Coun. Hargreaves
Cardiff	Ald. Sir J. W. Courtis	Ald. R. J. Smith
Chester	Ald. J. Jones	Coun. A. S. Dutton
Chesterfield ...	Ald. Sir E. Shentall ...	*Coun. Cropper
Colchester	*Coun. Everett	*Coun. Burleigh
Colne	Coun. R. Knight ...	
Coventry	Coun. H. W. Wale ...	Coun. J. Grant
Croydon	Coun. A. A. Thomson	Ald. G. J. Allen
Darlington ...	Ald. Sir C. W. Starmer	
Dartford	*Coun. Penney	Coun. W. J. Bourne
Darwen	Coun. Pickup	Coun. Butterworth
Derby	Coun. W. Eaton ...	
Doncaster	Coun. S. Balmforth ...	Coun. T. Bramworth
Dundee	*Coun. A. Malcolm ...	
East Ham	*Ald. H. Osborn	
Eccles	Coun. Alexander ...	Ald. Pearson
Edinburgh ...	*Coun. W. L. Sleigh ...	
Erith	Coun. G. C. Humphreys	
Exeter	*Coun. F. G. Towill ...	*Coun. F. Chick
Glasgow	Coun. T. Kelly	Bailie J. M'Whirr
Gloucester	Coun. J. O. Roberts-... (Mayor)	
Great Yarmouth	Coun. J. T. C. Salmon	Ald. D. McCowan
Halifax	*Ald. A. Fawcett ...	Coun. A. Broadley
Haslingden ...	*Coun. Halstead	Coun. Haworth
Heywood	Ald. J. Ashworth ...	Ald. T. Popple
Huddersfield ...	Coun. E. H. Sellers ...	Coun. T. Canby
Hull	*Coun. D. Willoughby	*Coun. Richardson
Ilford	*Coun. H. G. Odell ...	*Coun. H. L. Crofts
Keighley	Coun. A. Smith	
Kilmarnock ...	Coun. R. Lorimer ...	
Kirkcaldy	Coun. G. Fergusson ...	
Lancaster	Coun. Wilkinson ...	
Leeds	Ald. R. A. Smithson...	Ald. H. Brown
Leicester	Ald. S. Flint	Ald. G. Banton
Leith	Bailie Goalen	
Leyton	Coun. T. P. Haines ...	
Lincoln	Ald. W. S. White ...	
Liverpool	Ald. E. Russell Taylor	Ald. F. Smith
Lowestoft	Coun. F. Spashett ...	
Maidstone	Ald. D. T. J. Lyle ...	*Coun. Armstrong
Manchester ...	Ald. J. Bowes	Ald. A. W. Chapman
Middlesbrough ...	Coun. E. Turner... ...	Ald. J. Calvert
Nelson	Coun. W. F. Cooke ...	
Newcastle-on-Tyne	Coun. R. Mayne ...	Coun. A. M. Sutherland
Newport (Mon.)	Coun. J. Moxon ...	Ald. F. Phillips
Northampton ...	Coun. T. D. Lewis ...	Coun. W. Beale
Nottingham ...	*Coun. John Morris (Mayor) ...	*Coun. J. Clarkson
Oldham	Coun. Cheetham ...	Ald. Stanbury
Perth	*Coun. Fisher	
Plymouth	*Coun. J. H. Pillar ...	Coun. J. Moon
Pontypridd ...	Coun. M. L. Jones ...	
Portsmouth ...	Coun. J. Timpson (Mayor) ...	Ald. R. Payne
Preston	*Coun. T. Parkinson (Mayor) ...	*Ald. J. Ormrod
Rawtenstall ...	*Coun. H. Crabtree ...	
Reading	Ald. C. G. Field ...	
Rochdale	Ald. Taylor	
Rotherham ...	Ald. G. Gummer ...	Coun. G. E. Caine
Salford	Ald. H. Linsley	Ald. W. H. Barrett
Sheffield	Ald. Sir W. F. Clegg...	Ald. W. C. Fenton
Shipley	*Coun. F. F. Rhodes ...	Coun. H. Bradley
Southampton ...	Ald. F. A. Dunsford	
Southend-on-Sea	Coun. G. Radford ...	
Southport	Coun. Clayton	Coun. Richardson
South Shields ...	Ald. W. G. Wylie ...	Coun. J. G. Winskell
Stalybridge ...	Ald. H. Sykes	
Sunderland ...	Ald. G. New	Coun. W. Walker
Swindon	*Ald. Stevens	*Coun. Horder
Wallasey	Coun. Howse	Coun. Griffin
Walsall	Ald. J. Cope	Ald. J. Williams
Walthamstow ...	*Coun. J. W. West ...	
Warrington ...	Coun. Dr. Joseph ...	Ald. J. Wilkinson
West Bromwich	Ald. A. G. Turley ...	Ald. G. Garratt
West Hartlepool	Ald. Martin...	*Coun. Turnbull
Wigan...	Coun. Guest	Coun. Jas. Walkden (Mayor)
Wolverhampton	Ald. Sir C. T. Mander, Bart.	
York	Ald. S. W. Meyer ...	Coun. W. H. Sessions

INSTITUTE OF TRANSPORT.

President and Council.

The preliminary arrangements in connection with the formation of the Institute of Transport, of which particulars were given in our issue of November 13, are now well advanced, and it is hoped shortly to have ready application forms for membership, so as to commence the active work of the Institute early in the New Year.

The Right Hon. Sir Eric Geddes, G.B.E., K.C.B., M.P., Minister of Transport, has accepted the position of first president of the Institute, and the first Council has been elected as follows :—

Messrs. J. Allen (Oxford), J. Bagwell (Dublin), H. E. Blain London), Sir Alfred Booth (Liverpool), Sir Joseph Broodbank (London), Sir A. Kaye Butterworth (York), H. P. Currie (Newcastle-on-Tyne), Sir Francis Dent (London), C. A. Dutfield (London), Sir J. Eaglesome, K.C.M.G. (Leeds), Sir Sam Fay (London), Sir Maurice Fitzmaurice (London), S. E. Garcke (London), H. H. Gordon, L.C.C. (London), J. B. Hamilton (Leeds), R. J. Howley (London), Sir Wm. Joynson-Hicks, Bart., M.P. (London), Sir Lynden Macassey (London), D. A. Matheson (Glasgow), J. M. McElroy (Manchester), General Sir Henry Maybury (London), J. C. Mead (London), General Sir Philip Nash (London), Sir Julian Orde (London), Sidney Preston (London), Sir Wm. Raeburn, M.P. (Dumbarton, N.B.), Sir Alfred Read (London), G. Renwick, M.P. (Newcastle, Central), the Right Hon. Sir Albert H. Stanley, M.P. (London), Hon. Sir Arthur Stanley, G.B.E. (London), E. S. Shrapnell-Smith (London), F. Tatlow (Derby), Sir Herbert Walker, K.C.B. (London), J. Willmott (Warwick), and W. Wolsey, jun. (London).

Temporary office accommodation has been taken at 2 and 3, The Sanctuary, Westminster, two doors from Westminster Abbey (telephone number Victoria 422), and, pending the appointment of a permanent secretary, Mr. H. E. Blain is acting as hon. secretary to the Council.

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NATIONAL JOINT INDUSTRIAL COUNCIL FOR THE TRAMWAY INDUSTRY.

CONSTITUTION ADOPTED BY THE CONSTITUENT ASSOCIATIONS.

OBJECTS.

To secure the largest possible measure of joint action between employers and employees by the regular consideration and settlement of matters affecting the well-being and progress of the industry, as part of the national life.

It will be open to the Council to take any action that falls within the scope of this general definition. Among its more specific objects will be the following—

(*a*) The establishment and definition of functions of District Councils and Works Committees.

(*b*) The consideration of measures for the inclusion of all employers and employees in their respective organisations, and for securing the observance by them of collective agreements.

(*c*) The regular consideration, and, where possible, determination of wages, hours, and working conditions which affect the industry as a whole.

(*d*) The consideration of machinery for the settlement of differences between the parties and sections in the industry.

(*e*) The consideration of measures for securing regular employment, while providing the public with the most efficient service.

(*f*) The improvement of conditions with a view to removing danger to the health of the workpeople and minimising accidents.

(*g*) The consideration of safeguarding the rights of workpeople inventing or designing improvements in machinery and method.

(*h*) The training for the industry, and co-operation with the educational authorities in arranging education in all its branches for the industry.

(*i*) Inquiries into special problems of the industry, including the study of the organisation and methods of the industry in this and other countries, and, where desirable, the publication of reports.

(*j*) The collection of statistics and information on matters appertaining to the industry.

(*k*) Representation to any appropriate authority of the needs and opinions of the industry in respect of any matters affecting the constitution and continuance of the undertakings and the material well-being of all concerned in the industry.

(*l*) The consideration of any matters that may be referred to it by the Government or any Government department.

(*m*) The consideration of problems of reconstruction and labour resettlement arising out of the war, in so far as they affect the industry.

(*n*) Co-operation with the Joint Industrial Councils for other industries and other bodies to deal with problems of common interest.

CONSTITUTION.

1. MEMBERSHIP.—The Council shall consist of 44 members, representative of the industry, being 22 representatives of the employers and 22 representatives of the employees.

Employers' Representatives.—The representatives of the municipal tramways shall be 14 in number, and be elected from—(*a*) Members of tramway committees, and/or (*b*) officers of tramway departments.

The representatives of tramway and light railway companies shall be eight in number, and be elected from—(*a*) Directors of tramway or light railway companies, and/or (*b*) officers of tramway or light railway companies.

Employees' Representatives.—The representatives of the employees shall be 22 in number. *Note.*—The National Transport Workers' Federation have undertaken to secure that all the employees on the traffic staffs and the semi-skilled and unskilled men engaged in other branches of the industry shall be represented on the employees' side of the Council.

2. RE-ELECTION.—The members of the Council shall retire annually, and shall be eligible for re-election.

3. COMMITTEES.—The Council shall have power to appoint from its own members executive and other committees, and to determine the powers of such committees. Unless otherwise agreed, such committees shall be equally representative of both sides of the Council.

4. OFFICERS.—The officers shall consist of a chairman, a vice-chairman, a treasurer, and a secretary or secretaries. The chairman and vice-chairman shall be elected from the members of the Council; when the chairman is a representative of the employers, the vice-chairman shall be a representative of the employees, and *vice-versa*. The Council shall be empowered to appoint a treasurer, a secretary or secretaries, and the necessary staff, and shall be empowered to pay to them such remuneration as it may think fit.

5. MEETINGS OF THE COUNCIL.—The ordinary meetings of the Council shall be held as often as necessary, and not less frequently than once a quarter. A special meeting shall be called on the requisition of at least one-third of the Council. At least seven days' notice of such special meeting shall be given, and the business of the meeting stated in the notice.

6. VOTING.—The voting shall be by show of hands or otherwise, as the Council may determine.

All resolutions shall be regarded as carried if they have been approved by a majority of the members present on each side of the Council, subject to the following exceptions—

As regards any matter falling within the scope of (*k*) and (*l*) of the objects, or any matter not included in the specific objects, or any variation of the constitution of the Council under Clause 9 hereof, no resolutions shall be regarded as carried unless they have been approved by—(*a*) A majority of the employers' members present representing the municipal tramways. (*b*) A majority of the employers' members present representing the tramway and light railway companies. (*c*) A majority of the employees' members present.

A decision as to whether a matter does fall within the scope of (*k*) or (*l*), or is not included in the other specific objects mentioned, may be demanded by any two members of the Council, and shall be decided by the chairman of the Council. In the event of the decision of the chairman on this point being dissented from by any two members of the Council, the question shall be referred to the President for the time being of the Board of Trade, whose decision shall be final.

7. QUORUM.—Not less than one-half of the representatives of each side of the Council shall constitute a quorum.

8. FINANCE.—The administrative expenses of the Council shall be met by the two sides of the Council in equal proportion.

9. AMENDMENT OF CONSTITUTION.—The Council shall have power from time to time to amend or add to the above constitution in such way as it may think fit, subject to confirmation by the constituent associations of the respective parties.

DISTRICT COUNCILS.

FUNCTIONS.—The main functions of the District Councils shall be as follows:—(1) To consider any matters that may be referred to them by the National Joint Industrial Council, and to take executive action within their district in connection with decisions arrived at and matters deputed to them by it. (2) To make recommendations to the National Joint Industrial Council. (3) To consider any matters of interest to their district, including matters referred to them by Works Committees, and to take executive action with regard to matters that affect only their particular district, subject to the right of the National Council to veto any such action if it be found to involve the interests of other districts. Among the more specific functions falling under this head are—(*a*) The regular consideration of hours, wages, and working conditions, including the codification, unification, and amendment of working rules relating to holidays, juvenile labour, overtime, the shift system, etc. (*b*) The co-ordination of local working conditions. (*c*) General district matters relating to the well-being of the workpeople. (*d*) The consideration of safeguarding the rights of workpeople inventing or designing improvements in machinery and method. (*e*) The improvement of conditions with a view to removing danger to the health of the workpeople and minimising accidents. (*f*) The training for the industry and co-operation with the educational authorities in arranging education in all its branches for the industry. (4) Co-operation with the District Councils for other industries to deal with problems of common interest. (5) To consider any differences which cannot be settled within an individual undertaking, and, if necessary, to refer the same to the National Council. (6) No executive action shall be taken upon these matters if such action is likely to involve the interests of other districts.

CONSTITUTION.

1. *Areas of District Councils.*—It is suggested that the areas of the District Councils shall be as follows—

(*a*) Scotland.
(*b*) Northern area.
(*c*) Lancashire, Cheshire, and North Wales.
(*d*) Yorkshire, Lincolnshire, and North Derbyshire.
(*e*) South Wales.
(*f*) Midlands area.
(*g*) Metropolitan area.
(*h*) South-west and part of South Coast area.
(*i*) East, South-east, and part of South Coast area.

The tramway undertakings within the above areas are as follows—

A.—*Scotland.*

Municipal (8).—Aberdeen, Ayr, Dundee, Glasgow, Kilmarnock, Kirkcaldy, Leith, Perth.

Company (13).—Aberdeen Suburban Tramways Company, Limited; Airdrie and Coatbridge Tramways Company; Dumbarton Burgh and County Tramways, Limited; Dundee, Broughty Ferry and District Tramways Company, Limited; Dunfermline and District Tramways Company; Edinburgh and District Tramways Company, Limited; Falkirk and District Tramways Company; Greenock and Port Glasgow Tramways Company; Lanarkshire Tramways Company; Musselburgh and District Electric Light and Traction Company, Limited; Paisley District Tramways Company; Rothesay Tramways Company; Wemyss and District Tramways Company.

B.—*Northern Area.*

Municipal (5).—Darlington, Newcastle, South Shields, Sunderland, West Hartlepool.

Company (7).—City of Carlisle Electric Tramways Company, Limited; Gateshead and District Tramways Company; Jarrow

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and District Electric Traction Company, Limited; Middlesbrough, Stockton-on-Tees, and Thornaby Electric Tramways Company; Sunderland and District Electric Tramways, Limited; Tynemouth and District Electric Traction Company, Limited; Tyneside Tramways and Tramroads Company.

C.—*Lancashire, Cheshire, and North Wales Area.*

Municipal (26).—Accrington, Ashton-under-Lyne, Birkenhead, Blackburn, Blackpool, Bolton, Burnley, Bury, Chester, Colne, Darwen, Lancaster, Liverpool, Manchester, Nelson, Oldham, Preston, Rawtenstall, Rochdale, Salford, Southport, Stockport, Wallasey, Warrington, Staleybridge, Hyde, Mossley, and Dukinfield Tramways Board, Wigan.

Company (11).—Barrow-in-Furness Tramways; Blackpool, St. Annes and Lytham Tramways Company; Lancashire United Tramways, Limited, Lancaster Tramways Company, Limited; Llandudno and Colwyn Bay Electric Railway, Limited; Middleton Electric Traction Company, Limited; Morecambe Tramways Company; New St. Helens and District Tramways Company, Limited; Oldham, Ashton, and Hyde Electric Tramways, Limited; Glossop Tramways Company; Wrexham and District Transport Company, Limited.

D.—*Yorkshire, Lincolnshire, and North Derbyshire.*

Municipal (12).—Bradford, Chesterfield, Doncaster, Halifax, Huddersfield, Hull, Keighley, Leeds, Lincoln, Rotherham, Sheffield, York.

Company (7).—Barnsley and District Electric Traction Company, Limited; Dewsbury and Ossett Tramways Company; Great Grimsby Street Tramways Company; Mexborough and Swinton Tramways Company; Scarborough Tramways Company; Yorkshire (West Riding) Electric Tramways Company, Limited; Yorkshire (Woollen District) Electric Tramways, Limited.

E.—*South Wales Area.*

Municipal (5).—Aberdare, Cardiff, Newport, Neath, Pontypridd.

Company (4).—Swansea Improvements and Tramways Company; Llanelly and District Electric Light and Traction Company, Limited; Merthyr Electric Traction and Light Company, Limited; Rhondda Tramways Company.

F.—*Midlands Area.*

Municipal (9).—Birmingham, Burton, Coventry, Derby, Leicester, Northampton, Nottingham, Walsall, Wolverhampton.

Company (11).—Birmingham District Power and Traction Company; Dudley, Stourbridge and District Electric Traction Company, Limited; Ilkeston Tramways Company, Limited; Kidderminster and District Electric Traction and Light Company, Limited; Leamington and Warwick Electric Company, Limited; Mansfield and District Tramways, Limited; Notts and Derbyshire Tramways Company; Potteries Electric Traction Company, Limited; South Staffs Tramways (Lessee) Company, Limited; Wolverhampton District Electric Tramways, Limited; Worcester Electric Traction Company, Limited.

G.—*Metropolitan Area.*

Municipal (10).—Barking, Bexley (including Dartford), Croydon, East Ham, Erith, Ilford, Leyton, London County Council, Walthamstow, West Ham.

Company (3).—London United Tramways, Limited; Metropolitan Electric Tramways, Limited; South Metropolitan Electric Tramways and Light Company, Limited.

H.—*South-west and Part of South Coast Area.*

Municipal (4).—Exeter, Gloucester, Plymouth, Swindon.

Company (8).—Bath Electric Tramways Company, Limited; Bristol Tramways and Carriage Company, Limited; Cambourne and Redruth Tramways; Cheltenham and District Light Railways Company; Plymouth, Stonehouse and Devonport Tramways Company; Taunton Electric Traction Company, Limited; Torquay Tramways Company, Limited; Weston-super-Mare and District Electric Supply Company, Limited.

I.—*East, South-east, and Part of South Coast Area.*

Municipal (12).—Bournemouth, Brighton, Colchester, Great Yarmouth, Dover, Ipswich, Lowestoft, Maidstone, Portsmouth, Reading, Southend, Southampton.

Company (9).—Chatham and District Light Railways Company; Gosport and Fareham Tramways Company; Gravesend and Northfleet Electric Tramways, Limited; Hastings and District Electric Tramways Company, Limited; Isle of Thanet Electric Tramways and Light Company, Limited; Luton Corporation (Lessee) Company; Norwich Electric Tramways Company; Peterborough Electric Traction Company, Limited; Portsdown and Horndean Light Railway.

2. *Membership.*—The District Councils shall consist of not more than 20 members appointed as to one-half by the associations of employers and as to the other half by the trade unions. Members of the National Council shall be ex-officio members of the District Council in their area.

The number of members on the employers' side of the District Council representing municipal and company tramways and light railways respectively shall, unless otherwise agreed, be in proportion, as nearly as possible, to the relative number of municipal and company undertakings operating within the district.

3. Details of the constitution as to re-election of members, appointment of committees and officers, and other matters not included herein, will be based upon the general provisions contained in the constitution of the National Council.

Note.—The functions and constitution of the District Councils shall be subject to the approval of the National Council.

LONDON TRAMWAY ACCIDENT.

REPORT OF BOARD OF TRADE INSPECTOR ON DERAILMENT AND OVERTURNING OF AN L.C.C. CAR.

The Board of Trade has issued the report presented by Colonel W. J. Pringle on the result of his inquiry into the circumstances attending the accident which took place about 2.45 p.m. on August 16, at the junction of Great College Street with Pancras Road, on the London County Council Tramways. The text is appended.

1. Car No. 908 was travelling from Hampstead terminus on the south-bound track down Great College Street, when it left the rails on the curve into Pancras Road, crossed the north-bound track, as well as the double track in Crowndale Road, and collided with two section feeder-boxes on the pavement, at the north-west corner of Goldington Crescent Gardens. The car appears to have struck the right-hand feeder-box, and then to have overturned on to its near side, displacing and falling upon the left-hand feeder-box.

I regret to report that a pedestrian was killed by the car falling on him, and that two others are reported to have been injured. Of the passengers in the car, 26 suffered injury or shock effects, and one of these died subsequently. The roof of the car was dislodged when the collision with the feeder-boxes took place, and fell partly into the ornamental gardens. Considerable damage was done to the front near side end of the car, where it fell on the feeder-box. Arcing took place underneath the car after it overturned, owing to contact with the copper conductors of the feeder-box. This resulted in burning of paint-work, and, at two points, in charring of the woodwork of the panels.

2. The gauge of the London County Council Tramways is 4 ft. 8½ in., and the conduit system of traction is employed. Car No. 908 was of the double-truck, double-deck with top cover, vestibule type, and weighed unloaded 14 tons 11½ cwt. It was first licensed for service in January, 1909, and has a seating capacity for 32 inside and 46 outside passengers. Its principal dimensions were—

Length over collision fenders	33 ft. 10 in.
Height to centre of roof	15 ft. 7¼ in.
Extreme width	7 ft. 2 in.
Wheel base between bogie pivots ...	13 ft. 4 in.
Truck wheel base	4 ft. 6 in.
Diameter, driving wheels	31⅜ in.
Diameter, pony wheels	21⅜ in.

The driving wheels were renewed in November, 1918, and have since run 22,438 miles. The pony wheels were renewed in July, 1919.

It had two British Westinghouse type 220 motors, rated at 42 B.H.P., with controllers of type T2A, having four series and four parallel power notches, and seven notches for magnetic braking. It was fitted with a hand brake operating blocks on all eight wheels, and with the B.W. 25A type magnetic track brake (four magnets per car) with wheel block attachments. The car was overhauled, renovated, and re-licensed on October 26, 1918. It was out of service from August 1 to August 5, 1919, for controller repairs and general overhaul. The defect sheets and records show that such minor repair work to equipment, etc., as was reported to be necessary, or found to exist, has been promptly executed.

THE POINT OF DERAILMENT.

3. The permanent way in Great College Street was laid in 1909, and consists of rails originally weighing 105 lb. per yard, laid on concrete foundations. The outside rail of the south-bound track on the curve concerned was renewed in June, 1919. The inner rail is of the lipless type, with renewable check, weighing altogether 155 lb. per yard. The check of this inner rail was reversed in June, 1919. The paving is of wood blocks across the roadway. The width of the groove of the outer rail is 1⅛ in., and of the inner rail 1 $\frac{7}{32}$ in.

There is double track through Great College Street, laid in the centre of the roadway. The track is straight for a distance of 300 yards before reaching the left-hand curve, where the derailment took place. On its journey along Great College Street the car stopped at the "Stop by request" post, just before reaching the Royal Veterinary College. From this post ("A") the distances to the following points, etc., are approximately as follow:—

Boundary wall between Royal Veterinary College and Goldington Buildings	185 yards
Compulsory stopping-post	198 ,,
Tangent point of left-hand curve	199 ,,
Point of derailment, front truck wheels	211 ,,
Point of derailment, rear truck wheels	215 ,,
Point of collision with feeder-boxes	244 ,,

The gradients from "A" are as follows:—
0–25 yards, falling, 1 in 79.
25–125 ,, ,, 1 in 52.
125 yards to point of derailment, falling, 1 in 49.

The left-hand curve in question is spiralised, and has radii and uper-elevation as follow—

From	0–10	feet,	radius	342	feet,	super-elevation	⅜ inches.
,,	10–20	,,	,,	240	,,	,,	½ ,,
,,	20–30	,,	,,	89	,,	,,	⅝ ,,
,,	30–40	,,	,,	75	,,	,,	¾ ,,
,,	40–50	,,	,,	80	,,	,,	⅞ ,,
,,	50–60	,,	,,	92	,,	,,	1 ,,
,,	60–70	,,	,,	109	,,	,,	1⅛ ,,
,,	70–80	,,	,,	218	,,	,,	⅛ ,,

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The derailment therefore took place at a point on the curve where the radius is 75 feet and the super-elevation ⅛ inches.

4. The Board of Trade regulations for traffic are as follow—

(1) Speed is limited:
  (*a*) In Great College Street to 16 miles an hour.
  (*b*) On curves with radii between 66 and 150 ft. to eight miles an hour.
(2) All cars have to be brought to a standstill at the junction of Great College Street with Crowndale Road.

The following instructions, issued by the London County Council, are also applicable—

"Every motorman is expressly prohibited from approaching and passing curves and crossways at a speed exceeding four miles an hour."

Evidence of Motorman and Witnesses.

5. Motorman William John Poacher entered the service of the London County Council (after demobilisation) at the age of 24, in February, 1919. Previously he had been employed as a brewer's drayman. He received a month's training in the London County Council Tramway School, and had been employed as motorman on service cars since March 26. He holds a clear record. He gave evidence to the effect that he commenced duty on August 16 at 1.34 p.m., and drove car No. 908 from Hampstead to Holborn and back. He found the controller handle at the Hampstead end worked a little stiffly, but was quite manageable. He experienced no trouble with the car or its equipment on this first journey, and found the magnetic track brake acted perfectly. He left Hampstead for the second time at 2.25 p.m., and was running to schedule time. He was hailed in Great College Street, applied the magnetic brake to reduce speed, and brought the car to a standstill without difficulty, by means of the hand brake, at the "Stop by request" post near the Royal Veterinary College. When he received the signal to start, he released the hand brake and applied power up to the fifth notch, to give the car impetus to start, and shut off power when a speed of about 12 miles an hour had been attained. About 70 yards, or seven car lengths, from the compulsory stopping place on the curve, before entering Pancras Road, when the speed of the car was 12 to 14 miles an hour, he applied the magnetic brake slowly to the third notch, but, feeling no braking effect, continued the application rather rapidly to the last (seventh) notch. He still felt no braking effect; on the contrary, the car was increasing its speed. He therefore released the magnetic brake and reapplied it rapidly to the full extent, but it still had no effect. At this moment he had not quite reached the compulsory stopping place. He left the controller handle on full brake power, and applied the hand brake. He was pulling hard at the hand brake when the car reached the curve, left the track, crossed the roadway, collided with the two section feeder-boxes, and overturned. He remained at his post and fell with the car. The rails were dry, and he did not use sand.

The accident was witnessed by motorman Haden, whose car was standing on the north-bound track in Pancras Road. He described the speed of the car as it reached the curve as very fast—14 or more miles an hour—and expected to see the car overturn at the curve. He confirmed motorman Poacher's statement that he was pulling hard on the hand brake as he entered the curve. After the car had overturned, Haden found the controller handle on the seventh brake notch.

Results of Inspection of the Car.

John Leach, charge-hand of the breakdown gang, on arrival at the scene of the accident, examined the controller at the front end of the car, at about 3.10 p.m. The key was in the forward position, and the controller handle at that time at the fourth brake notch. From the number of turns on the brake spindle, and the position of the ratchet, he judged that the hand brake was hard on when the accident happened, although, as the sway bar brake chain broke as the result of the overturning the wheel blocks were eased off.

The conductress on car No. 908 (Amy Shepherd) stated that there were from eight to ten passengers on the upper deck and 12 to 14 on the lower deck. Her evidence, and that of passengers, was to the effect that the car was not travelling at any unusual speed along Great College Street as it approached the compulsory stopping place.

John Pearce, coal porter, who travelled inside the car on the off-side in the front seat behind the motorman, stated that he noticed that the driver began to check the speed of the car at the usual place. He defined this point as the boundary wall separating the premises of the Veterinary College from Goldington Buildings, i.e., 13 yards from the post defining the compulsory stopping place. From the moment he began to check the speed of the car the motorman was using both brake handles. He thought the speed was being reduced to commence with, but the slowing down did not continue. The car jolted as it left the rails, and the motorman then began to shout in order to give people warning of danger.

Mr. H. S. May, rolling stock superintendent, after I had inspected the car on August 19, made a detailed examination of the car and equipment. The wheels were found true to gauge and without flats. On hard steel tires he did not expect to find any visible sign as a result of skidding for short distances. He considered the flanges to be in good condition, and furnished full size sketches of the section of the tires of the leading wheels. Damage was done, when the car overturned, to the two truck magnets at the leading end of the car, and also to the hand brake sway bar chain. When this damage had been repaired the action of the brake equipment was tested. The magnetic brake was found to act on all seven notches—the action being somewhat sluggish on the first three. The hand brake was in perfect order, and required 1½ turns of the brake chain on the spindle to apply it fully. Without adjustment the hand brake was found capable of stopping the car. With regard to the electrical equipment, a rheostatic grid was found to be broken—a clean fracture, without any signs of burning, indicating that the fracture must have occurred when the car overturned. In the brake circuit the turns of No. 2 magnet coil were found to be partially shorted. The effect generally of the fault would be to give a sluggish initial brake action. Mr. May did not think that, with a service application of the magnetic brake as described by motorman Poacher, a car travelling at 16 miles an hour could be stopped in two or three car lengths. A much more rapid movement of the controller handle would be necessary.

Experiment in Speed from Gravity.

6. I inspected the site and car concerned on August 19. Marks on the roadway showed that the front wheels left the rails about 10 feet before those of the rear truck. The track, as regards rails, was in adequate order, and the super-elevation sufficient, on the sharpest portion of the curve, for speeds of four to five miles an hour The tires of the leading wheels showed considerable wear. In addition to the wear on the treads the depth of the flanges had been reduced to not much more than one-half that of an unworn tire, This, and the blunted profile of the circumference of the flanges, showed that the car has done considerable riding on the flanges. The back of the flange of the near front wheel showed much wear from check rails. It is clear that, with such flanges, there would be a greater liability to derailment, especially on left-hand curves, than with an unworn tire. I agree with Mr. May that skidding of the wheels might take place over a considerable length of rail before visible results, in the way of flattening, would be evident on such hard tires.

Motorman Poacher's statement that he commenced to apply the magnetic brake 70 yards from the compulsory stopping place is negatived by the evidence of John Pearce. The latter, as the result of experience of travelling on this route, stated that Poacher began to check the speed of the car at the "usual" place, i.e., the north-east boundary wall of Goldington Buildings, which is 13 yards from the stopping point. Poacher estimates that the speed of the car was from 12 to 14 miles an hour when he began to try to reduce speed. From an experiment made by the tramway officials, a speed of 12 miles an hour is attainable, starting from rest from the "Stop by request" point referred to, from the effect of gravity alone. Poacher started from rest, using five notches of current, and in such circumstances a car would attain a speed considerably in excess of 12 to 14 miles an hour.

The experiment conducted by Mr. May after the accident showed no defect in the braking efficiency, other than a sluggishness with the magnetic brake on the first three notches. Moreover, if the magnetic brake was utilised with the desired effect by Poacher in stopping a car at the "Stop by request" point in Great College Street, it is difficult to understand why it should have failed completely on all brake notches 185 yards further on, if the proper speed limit had been observed, and the brake equipment had been properly utilised.

Inspector's Exhortation to Motormen.

7. My conclusions on the whole case therefore are:—

(1) That there is evidence to show that the hand and magnetic brakes were in working order if they had been properly used when the accident took place.
(2) That the speed developed on the journey towards the compulsory stopping place was higher than that authorised, i.e., 16 miles an hour.
(3) That the magnetic brake was in all probability not utilised early enough to check the speed of the car and bring it to a standstill at the required point.
(4) That, eventually at least, owing to mismanagement, by an over forcible use of the hand brake in conjunction with the magnetic brake, locking of the wheels resulted, which caused derailment on the sharpest part of the curve, and the subsequent overturning. It is possible that, if the wheels had not been locked, the car might have kept the rails.

The forward movement of the car, after collision with the feeder pillars, was not such as to indicate that it was travelling at a higher speed than 10 miles an hour when the collision took place. It is clear, I think, that retardation was taking place.

8. The accident, with its regrettable results, illustrates the danger, especially with worn and shallow flanges—which are nowadays inevitable from travelling over much worn rails—that is likely to arise from speeds higher than those authorised, if over hasty

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and forcible applications of the hand and magnetic brakes are made. The attention of motormen should be called to this point, and to the necessity for observing speed restrictions.

I noted, in respect of the compulsory stopping place in Great College Street, that the place assigned for the car to come to rest is in front of the actual post, i.e., on the curve. I am informed that the reason for permitting cars to pass the post before coming to a standstill is to give the motorman a better view of traffic in Crowndale Road. I do not think that this is an adequate reason. Where sharp curves are concerned, there is danger in the curvature. The dead stop should be made, in the interests of safety, before the curve commences, and the present practice should, I consider, be altered accordingly.

As the super-elevation on the curve in question is not enough to justify a speed of eight miles an hour, I further recommend the following addition to Regulation 5, under the head, " Four Miles an hour," " on the curve between Great College Street and Pancras Road.

SIDE CONTACT DESIGN FOR RAILWAY ELECTRIFICATION.

Mr. E. Goolding writes that in order to avoid any misconception he wishes to point out that the modifications in the side contact design for railway electrification suggested in his article in our issue of November 13 were put forward only for consideration as to their practical adaptability. The side contact design as covered by Sir John Aspinall's patent has for several years been working with complete success on the Lancashire and Yorkshire Railway, and it was illustrated in the description of the equipment of the Manchester to Bury section on the direct current system at 1,200 volts in the TRAMWAY AND RAILWAY WORLD of January 13, 1916.

THE MINISTRY OF TRANSPORT.

New Parliamentary Secretary.

Sir Rhys Williams, Member of Parliament for Banbury, did not long occupy the position of Parliamentary Secretary to the Ministry of Transport, and on his resignation he has been succeeded by Mr. Arthur Neal, Member for the Hillsborough Division of Sheffield Sir Eric Geddes may have a partiality for a lawyer to act as his lieutenant in the House of Commons; at all events, Sir Rhys Williams is a K.C. and Mr. Neal is a solicitor. Mr. Neal has received many congratulations on his rapid promotion to a post in the Government, and on December 2, when he for the first time answered questions in the House of Commons addressed to the Ministry of Transport, he was warmly cheered. Mr. Neal only entered Parliament in December, 1918, but there is no surprise at his promotion. From the first he showed a remarkable grasp of the subjects on which he spoke, and a great breadth of view and wide knowledge which enable him to reason from the general to the particular with remarkable lucidity and accuracy. He was a member of the Standing Committee of the House of Commons which discussed every detail of the Ministry of Transport Bill and the Electricity (Supply) Bill, and he showed his ability in debate on the difficult and complex problems which continually arose. Probably no other member more thoroughly knows the two measures referred to, and his grasp, coupled with his powers of clear exposition, ought to render him a valuable Parliamentary asset to the Ministry.

PERSONAL.

Mr. E. H. Bond, general manager of Dover Corporation Tramways, has been granted a war bonus of £50 per annum.

Mr. W. G. Marks, traffic superintendent of Rotherham Corporation Tramways, has been granted an increase in salary to £300 a year.

Mr. J. H. Pillar has been elected chairman of the Plymouth Tramways Committee, and **Mr. J. Moon** has been re-elected vice-chairman.

Mr. S. H. Richards, late of the Calcutta Electric Supply Company, has joined the sales staff of Ferranti, Limited, as sales engineer for the South of England.

Mr. H. K. Beale, a member of the firm of Messrs. Beale and Company, solicitors, has been appointed chairman of the Birmingham Electric Supply Committee.

Mr. Percy B. Rycroft has resigned his position as technical adviser to the Controller of Coal Mines, to take up an appointment with Babcock and Wilcox, Limited.

Alderman T. Baker, late chairman of the Plymouth Tramways Committee, has been presented with the freedom of the borough enclosed in a silver casket, and Mrs. Baker has been presented with a silver rose bowl.

Mr. Howatt, power station superintendent at Southampton, has been promoted chief assistant to the electrical engineer at a salary of £420 a year. **Mr. Hooper** becomes power station superintendent at a salary of £300 a year.

Sir Harry Haward, comptroller of the London County Council, and **Mr. A. L. C. Fell,** general manager of the tramways department, have been authorised by the Council to give evidence to the Departmental Committee on Silver Coinage.

Alderman E. Russell Taylor proposes to tender his resignation as chairman of Liverpool Tramways Committee owing to increase of business engagements, which prevent him from giving the time which he has hitherto devoted to the work of the committee.

Mr. J. B. Hamilton, general manager of Leeds City Tramways, has been retained by the St. Anne's-on-Sea Urban Council to report upon the undertaking of the Blackpool, St. Anne's, and Lytham Tramways Company, which is being purchased by the Council.

Mr. A. L. C. Fell, general manager of the tramways department, has been authorised by the London County Council to serve on the sub-committee appointed by the Advisory Committee on London Traffic to deal with the improvement of existing forms of street facilities.

Mr. J. Townley has been appointed chief assistant electrical engineer of Sunderland Corporation electricity department, at a salary of £522 per annum. He succeeds Mr. S. R. Windle, who has been appointed electrical engineer of the Doncaster Corporation electricity works.

Mr. W. B. Ireland, O.B.E., rolling stock engineer of the London County Council's tramway department, has been authorised to give evidence in the High Court on behalf of the West Ham Corporation in regard to the T.2G. Westinghouse controller and its use by the Council.

Colonel C. J. Gore, who was one of the passengers in the car on the Burton and Ashby Light Railway which overturned on October 5, has forwarded to the treasurer of the Burton Infirmary £100 5 per cent. War Loan as a contribution to the funds of the institution to mark his gratitude for escape from serious injury. Colonel Gore was alighting from the top deck when the car overturned and he was thrown into some gardens, but escaped with slight bruises.

At the anniversary dinner of the St. Andrew's Society of Glasgow held recently, the Earl of Cassilis presiding, **Mr. James Dalrymple, J.P.,** general manager of the Glasgow Corporation Tramways, who is president of the Glasgow branch of the Society, was presented with his portrait in oils painted by Mr. J. Raeburn Middleton. The painting was formally unveiled by the Earl of Cassilis, who warmly eulogised Mr. Dalrymple's many public services and assured him of the cordial felicitations of the Society.

Mr. D. M. Watson, B.Sc., Assoc. M.Inst.C.E., has entered into partnership with Messrs. Dodd and Dodd, M.M.Inst.C.E., civil and consulting engineers, of County Chambers, Corporation Street, Birmingham. Mr. Watson has both American and English experience of professional work, while Messrs. Dodd and Dodd have had some 35 years of wide and varied experience in the design and construction of civil engineering work, both in England and abroad. The name of the new firm is Dodd, Dodd, and Watson.

Mr. C. R. Everson, who recently retired from the position of general manager of the Plymouth Corporation Tramways, at a meeting of the Town Council on November 17, was presented by Mr. J. Baker, on behalf of the subscribers, with an illuminated copy of the resolution passed at the previous Council meeting, referring appreciatively to his record as manager of the tramways for the past 26 years. Mr. Everson, in returning thanks, spoke of the growth of the undertaking during his managership. The new tramways manager, **Mr. H. P. Stokes,** was formally welcomed.

Councillor B. Haigh, a member of the Liverpool Tramways and Electricity Committee, who has just returned from a visit to New York, said he expected to find the American tramway systems would have many points of advantage compared with the Liverpool system, but speaking generally this was not so. He found that the private undertakings in New York were financially in a bad way. This is apparently due to the fact that passengers by the use of transfer tickets were allowed to travel over several routes for the payment of one fare.

Mr. David James, who has long been well known in the tramway industry as general manager of the Swansea Improvements and Tramways Company, has been appointed a magistrate. He entered the service of the Swansea Tramways Company as an office boy over forty years ago, and was successively promoted to the positions of junior clerk and chief clerk, and in 1899 he was appointed general manager. He is also managing director of the South Wales Transport Company. During the war he was a member of the Glamorgan Appeal Tribunal, and was on the Swansea Intermediary Board of the Appointments Departments of the Ministry of Labour. He was a member of the Court of Referees (Unemployment Department).

The " Commonwealth Engineer " records the death, at Adelaide, of **Mr. S. B. Moulden,** chief assistant electrical engineer to the Adelaide Municipal Tramways Trust.

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ENGLISH ELECTRIC COMPANY'S EXPANSION.

PURCHASE OF THE SIEMENS WORKS AT STAFFORD.

About the middle of November it was announced that the English Electric Company had bought the Siemens works at Stafford. This marks a further important stage in the development of the policy of the English Electric Company, which was formed early in this year, and represents the consolidation of the interests of Dick, Kerr and Company, the Coventry Ordnance Works, Willans and Robinson, and Phœnix Dynamo.

The comprehensive scheme of the amalgamation places the company in a position not only to undertake contracts of any magnitude or description in world-wide competition, but to arrange for the scientific sectionalising of the various manufactures of the group with a view to the maximum efficiency in production at the several works in Preston, Coventry, Bradford, Scotstoun, Rugby, and now Stafford.

A working agreement has been entered into between the English Electric Company and Siemens Brothers and Company, providing for the preferential exchange of the special products of each. Thus both companies benefit, as both now command the supply of a greater variety of manufacture than hitherto.

ST. ANNES TRAMWAYS PURCHASED.

The debenture holders of the Blackpool, St. Annes, and Lytham Tramways Company have received a circular stating that a provisional agreement has been made with the St. Annes District Council by which that Council will purchase the whole undertaking of the company, excluding certain lands and liquid assets, at £135,000. This will enable the trustees, who have been in possession of the undertaking since 1903, on behalf of the debenture holders, to pay off these holders at par. They will, however, be unable to pay the arrears of debenture interest, although of late years the position of the undertaking has improved. The full rate of 5 per cent. interest has been paid for the last four years owing to war traffic conditions at Blackpool, but the trustees cannot hold out any certainty of this improvement continuing, owing to the higher wages and greater cost of material. The distribution of £10,000 is also recommended among the preference and ordinary shareholders, who have never received any interest. Another recommendation is that £5,000 should be distributed among the directors, managers, engineers, and other officers of the company. The Council will in due course seek Parliamentary powers to purchase the undertaking.

FINANCIAL REPORTS AND MEETINGS.

INDIAN ELECTRIC SUPPLY AND TRACTION COMPANY, LIMITED, have announced an interim dividend of 3 per cent. on the ordinary shares.

EDISON-SWAN ISSUE.—The subscription list in connection with the recent offer of 360,000 Edison-Swan £1 ordinary shares at 21s. 6d. was several times over subscribed.

BRITISH ELECTRIC TRACTION COMPANY, LIMITED.—A dividend has been announced of 6 per cent. per annum on the preference stock for the half year ended September 30.

THE CHLORIDE ELECTRICAL STORAGE COMPANY, LIMITED, have announced a dividend of 5 per cent., free of tax, on the ordinary shares. The rate is the same as a year ago.

TORQUAY TRAMWAYS COMPANY.—The ordinary shares of £1 each fully paid, of which there are £120,000, have been placed by the Stock Exchange Committee on the list of officially quoted securities.

ELECTRIC CONSTRUCTION COMPANY, LIMITED.—The following dividends have been declared for the year ending March 31, 1920:—7 per cent. on the preference shares, less income tax, and 6 per cent. on the ordinary shares, less tax.

PERNAMBUCO TRAMWAYS AND POWER COMPANY.—An issue of £200,000 8 per cent. ten year notes has been subscribed by the shareholders and debenture holders at par. The notes will be issued in denominations of £100 and £500, and they will be redeemable at par on January 1, 1930, and will be subject to earlier redemption at par at the option of the company at any time after January 1, 1925, on three months' notice.

ANGLO-ARGENTINE TRAMWAYS COMPANY.—In response to inquiries from shareholders with reference to market rumours that the company is likely to pay arrears of dividend on its first preference shares at an early date, the London manager has been authorised to state that the prospects of the company are dependent on the revision of tariffs, which has not yet been authorised by the authorities, and that no question of payment of dividend can come under consideration at present.

EAST HAM CORPORATION TRAMWAYS.—The report for the year ended March 31 last shows that the total receipts amounted to £84,848, an increase of £13,611 over the previous year. The operating costs amounted to £85,691, an increase of £21,775. There was thus a gross loss of £843 as compared with a gross profit of £7,321 in the previous year. The loss at the end of the financial year was £11,174, as compared with a deficiency at the end of the previous year of £3,376.

IPSWICH CORPORATION TRAMWAYS.—The annual report of Mr. Frank Ayton, chief engineer and manager of the electric supply and tramways department of Ipswich Corporation, contains the usual statement of results. For the year ended March 25, 1919, the income was as follows:—Revenue, £38,775; contribution from the rates to renewals fund, £3,422; bank interest, £25, making a total of £42,222. The working expenses were £30,279, including war service allowances of £578. Capital charges, including interest and repayment of loans, amounted to £5,648, while a sum of £3,422 was paid to the fund for the renewal of permanent way, making a total expenditure of £39,349. The total working expenses showed an increase of £3,208, or 11·85 per cent. Wages to motormen and conductors are £1,615 higher, or 18 per cent. Although the car mileage was less than in the previous year by 154,831 miles (24·2 per cent.), the number of passengers carried increased by 154,831, or 2·55 per cent. The total car mileage amounted to 473,893, and the passengers carried to 6,224,608. Energy per car mile consumption averaged 1·151 units. The total revenue per car mile was 19·637d., and the percentage of working expenses was 78·09. The Corporation now operates about 11 miles of track and has 36 cars.

SHEFFIELD CORPORATION TRAMWAYS.—The report of the Sheffield Corporation tramway and motor undertaking for the year ended March 25, 1919, shows that the total capital expenditure at that date amounted to £1,241,282. Since the undertaking came into the hands of the Corporation it has earned, after meeting all necessary expenditure, including interest on loans, a total sum more than sufficient to meet the whole of the capital expenditure. The total income for the past year amounted to £662,536, and the working expenses were £499,373, including £10,647 paid to dependants of employees in H.M. Forces. The gross profits were £163,163. After deducting interest and sinking fund payments and income tax there is a balance of £63,218. Of this amount £39,065 was paid to the renewals fund and various other allocations were made, while £9,228 were transferred to the general district rate and development committee. The income from motor omnibuses amounted to £45,403 and the expenditure to £41,015, leaving gross profit of £4,388. After deducting interest, sinking fund, and income tax, the net balance is £83. A comparative summary of the accounts for the past four years is appended.

	1919	1918	1917	1916	1915
Income—					
Traffic revenue	£653,406	£595,159	£519,281	£449,946	£391,535
Sundry receipts	9,130	6,286	6,404	5,663	4,341
Total income	662,536	601,445	525,685	455,609	395,876
Expenditure—					
Traffic expenses	245 176	189,618	155,088	132,399	120,296
General expenses ...	34,399	30,410	27,905	25,460	26,077
Repairs account	109,459	99,069	68,483	47,796	45,385
Power expenses	99,692	94,632	84,290	65,284	49,365
Total working expenses ...	488,726	413,729	335,766	270,939	241,123
War allowances	10,647	11,037	11,849	11,210	5,707
	499,373	424,766	347,615	282,149	246,830
Gross profit	163,163	176,679	178,070	173,460	149,044
Interest and sinking fund	66,359	65,436	64,742	63,818	73,540
Income tax on profits ...	33,586	27,339	24,850	13,862	5,567
Street improvements ...	8,286	8,425	8,381	8,159	7,882
Renewals fund	39,065	36,036	34,698	30,115	30,018
Surplus fund	1,145	903	1,180	8,049	7,163
Special purposes fund ...	4,500	2,000	2,000	2,000	2,000
Grant to Sheffield University	—	—	—	5,000	—
On capital account ...	993	417	1,175	601	—
Relief of rates	9,229	36,122	40,098	41,856	22,876
Mileage of track	79	79	79	79	79
Passengers carried ...	163,799,188	153,506,213	142,551,547	123,429,410	107,023,195
Fare per passenger ...	·958d.	·930d.	·876d.	·878d.	·878d.
Car mileage	9,468,186	9,761,994	9,662,012	8,867,726	8,810,252
Units per car-mile ...	2·425	2·378	2·327	2·172	1·979
Power cost per car-mile...	2·527d.	2·327d.	1·765d.	2·094d.	1·189d.
Traffic receipts per car-mile	16·563d.	14·632d.	12·899d.	12·176d.	10·664d.
*Expenses per car-mile ...	12·388d.*	10·172d.*	8·340d.*	7·333d.*	6·568d.*
*Ratio of expenses ...	74·699%*	69·489%*	64·451%*	59·926%*	61·116%*
Number of cars in stock ...	350	347	349	339	339

* Excluding War allowances.

Electric Traction in India.—A resolution in favour of the electrification of the suburban railways within a radius of 25 miles of Calcutta has been adopted by the Legislative Council of India. Mr. G. Barnes said the Government recognised the importance of improving the train service to the suburbs and they had no hesitation in accepting the motion. It is proposed to call together representatives of the three large railway systems (Eastern Bengal, East Indian and the Bengal Northern Railways) and to ask representatives of the Chamber of Commerce to meet them, when the whole question would be discussed.

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TRAMWAY AND LIGHT RAILWAY NOTES.

ACCRINGTON.

TRAMWAY SHELTER PRESENTED BY A FORMER TOWNSMAN.

Mr. Thomas Gordon, J.P., a former citizen of Accrington, has sent to the Mayor of that town a cheque for £150 for the erection of a tramway shelter. He states that he has given the shelter as a token of his appreciation of Councillor Moffit's election to the position of chief magistrate.

AYR.

PERMANENT WAY RENEWAIS.

Ayr tramways permanent way requires immediate renewal on a considerable portion of the routes. Mr. J. Ferguson, electrical engineer of Glasgow Corporation Tramways, who was called in to report on the undertaking, states that the rails on a portion of the route and some of the cross-overs require immediate attention. The cars are in fairly good condition, although in need of repair, but several of the tramway standards are in a dangerous condition.

BEXLEY.

WORKMEN'S TICKETS.

In a report on the Bexley tramway undertaking, the general manager, Mr. J. Makin, has suggested that the position of the undertaking might be improved by various alterations. In order temporarily to meet the deficit, he recommends the abolition of the workmen's weekly tickets, which would result in an increase of £2,000 per annum in revenue. He does not propose to interfere with the workmen's daily tickets, except to extend their issue from 8 o'clock to 8.30. The reorganisation scheme would include the discharge of those who have filled men's places during the war. It would be necessary to dispense with the services of the war period workers, as this would mean a saving of £400 a year, and their places would be taken by returned service men.

BLACKPOOL.

FINE FOR AVOIDING PAYMENT OF FARE.

A girl has been fined 10s. by a Blackpool magistrate for attempting to avoid payment of fare. On behalf of the Corporation, it was stated that an inspector on boarding the car pointed out to the defendant that the ticket only carried her to Manchester Square, and that she would have to pay another penny. When she was leaving the car she gave a false address. Mr. J. W. T. Loftus, who prosecuted on behalf of the Corporation, said that the practice of over-riding was difficult to prevent and should be stopped.

GLASGOW.

CAR OVERTURNED—PASSENGER AWARDED DAMAGES.

On November 10 a Glasgow Corporation car, proceeding along London Road, collided with a wagon loaded with a 22-ton casting, which was being drawn by two traction engines. The engines, after allowing a tramcar to pass, were crossing the road when the accident occurred. The car was overturned and fell on the pavement, the upper part of the car completely smashing the front railings of a two-storey building. There were about twenty passengers in the car, and nine persons were taken to the Royal Infirmary, two being detained there. Several passengers had remarkable escapes from serious injury. One lad was pinned between the broken woodwork of the top deck of the car and the pavement, and was released with difficulty. Traffic on the route was held up for several hours, and the damaged car was finally drawn clear of the rails by the traction engines.—A settlement has been effected by the payment of £115 by the Glasgow Corporation in an action brought by Agnes W. Paul for £750 as damages for personal injuries received on August 1, 1918, in an accident in Glasgow. The complainant was a passenger in a tramcar when a horse yoked to a van belonging to the tramways plunged forward against the side of the car and smashed a window. The complainant fainted through fright when the glass was broken, and she alleged that owing to nervous shock she had been unable to do any work since.

GLOUCESTER.

INCREASED COST OF WAGES.

At a recent meeting of the Electricity and Light Railways Committee of Gloucester Corporation, the engineer and general manager, Mr. F. H. Corson, reported that he had received a letter from the branch secretary of the Amalgamated Association of Tramway and Vehicle Workers, asking that the recent award to members of the Transport Workers' Federation engaged in the tramway undertaking should be extended to the members of that Association engaged at the electricity station. The engineer stated that he had replied that the matter should be dealt with by the Joint Industrial Council established for the electricity supply industry. Referring to the wages award, the chairman of the committee said that since the estimate for the current financial year had been framed they had had the 48-hour week agreement, which was costing the Corporation £1,550. With the war bonus claims allowed they had an additional expenditure to meet for wages of over £5,000 above the sum estimated for in March last. Their revenue was not keeping pace with this large growth in expenditure.

HALIFAX.

PROPOSED EXTENSIONS.

An extension of the Halifax Corporation Tramways is proposed, and a Bill will probably be promoted in Parliament next session to obtain powers for the construction of tramways from the Calder and Hebble Inn, Huddersfield Road, to Halifax, and from Halifax to a point near Elland, and from Hebden Bridge to Whitely Arches. Power will also be sought to increase the present maximum tramway fares.

HULL.

CARS BLOCKED BY CATTLE DROVE.

A butcher was fined £3 12s. 6d. at Hull, on November 14, for obstructing tramway traffic on October 29. A driver and conductor stated that the defendant with a herd of about forty cattle got in front of their car and made no effort to allow the car to pass. The cattle obstructed the car for a distance of about a mile and a half, and other cars were also delayed.

LIVERPOOL.

FINE FOR OBSTRUCTING A TRAMCAR.

The *Liverpool Courier* remarks that tramcar baiting by drivers of other vehicles is likely to prove an expensive pastime in Liverpool. In the case of a motor lorry driver, charged with deliberately obstructing the passage of a car, the representative of the tramways department said the defendant ran his lorry just in front of the car, thereby reducing its speed to a comparative crawl. The lorry driver, who pleaded ignorance of the car behind, was fined 40s.

ROCHDALE.

NEW CARS.

Rochdale Corporation propose to purchase ten new cars at an estimated cost of over £20,000.

SHEFFIELD.

NEW TRAMWAY DEPOT.

Work on the new tramway depot in Pickmere Road, Sheffield, is proceeding rapidly, but delivery of material has at times been delayed and consequently the depot will not be ready as early as was expected. It will be the second largest in Sheffield, the Shoreham Street depot, with accommodation for 110 cars, being the largest. The new depot will be 200 ft. in length and 150 ft. wide, and will accommodate 66 cars. The total cost will be about £35,000. The front is of stone and brick, and will have six entrances.

SOUTHPORT.

REDUCTION OF STAFF.

On the ground of economy the inner circle service has been withdrawn and as a consequence the staff is being reduced by about 16 men. The services of all women employed during the war were dispensed with some time ago. The inner circle service will, however, be resumed in the spring and summer months by what is known as the grand tour cars.

SUNDERLAND.

THROUGH RUNNING.

The Sunderland Corporation Tramways Committee have decided to recommend the Council to adopt the scheme of through running powers with the Sunderland and District Tramways Company, subject to agreement on certain matters.

WAKEFIELD.

LORRY DRIVER CAUSES COLLISION.

At Wakefield on November 18 the Yorkshire (W.R.) Electric Tramways Company were sued by Messrs. J. Harrison and Sons, fruit and potato merchants, for damages to a motor wagon alleged through negligence on the part of one of the tramcar drivers. The tramway company counter-claimed for £5 9s. 9d. damages. For the plaintiffs it was said that the driver of the van was obliged to pull up on the tramway line to allow another vehicle to pass. At the same time a tramcar ran into him. For the tramway company it was shown that owing to the tramcar approaching a blind corner the motor wagon stopped practically under the nose of the driver, who had only about six yards in which to pull up. He succeeded nevertheless in minimising the collision. Judgment was given for the company on the claim and also on the counter claim.

YORK.

LOSS ON WORKMEN'S CARS—PROPOSED EXTENSIONS.

Mr. J. W. Hame, tramway manager, in reporting to the York Tramways Committee on the cost of running workmen's cars, states that the number of workpeople carried per week averaged 19,098, and the income therefrom 9·43d. per car mile. The working expenses, not including the proportion of interest and sinking fund charges, are 15·56d. per car mile The average receipts per passenger are 1¼d. and the cost per passenger 2d., exclusive of interest and sinking fund charges. The deficiency on the workmen's traffic at present is £2,768 per annum, apart from any capital charges. The manager has been instructed to report as to any unexercised power the committee possess in regard to workpeople's fares, and he has been asked to suggest what further powers should be obtained. The city engineer of York has presented a report on the suggested routes for completing the city's tramway system. He estimates that for four extensions, including £24,000 for cars, the total expenditure would amount to £143,517.

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CONTRACTS AND ORDERS.

Aberdeen Corporation propose to purchase a new overhead tower wagon at a cost of £1,200.

Cammell Laird and Company, Limited, have received an order from the London Electric Railway for trailer cars and from the Central London Railway for bogies.

Sheffield Corporation have accepted a tender for 75 double-deck tramway cars, exclusive of equipment, from the Brush Electrical Engineering Company, Limited, at £82,000.

Bournemouth Corporation have accepted the tender of Bolckow, Vaughan and Company, Limited, for rails, and of the Forest City Electric Services Supply Company for rail bonds.

Portsmouth Corporation have received tenders for tramway rails, the lowest tender, that from an American company, being £5,000 less than any tender submitted by a British manufacturer.

Bradford Tramways Committee have decided to order 62 sets of motors and 86 trucks, which it is hoped will be delivered within six months. The Committe have under consideration the extension of their railless system.

The Forest City Electric Services Supply Company, of Salford, have recently received orders for automatic point controllers from the Dublin United Tramways Company, Limited, the Auckland Electric Tramways Company, and the Birmingham Corporation Tramways. Four machines are being supplied to the latter.

St. Helens Corporation have placed an order for a turbo-alternator and condensing plant with Machinenfabrik Ateliers de Construction Oerlikon, Switzerland. The condensing plant will be made by Messrs. Hicks, Hargreaves and Company, of Bolton, and the economisers will be supplied by Messrs. E. Green and Son, Limited, of Wakefield.

Glasgow Corporation have accepted the following tenders:—Special D.C.C. wire, British Insulated and Helsby Cables, Limited; steel pinions for 49B armatures, Alfred Wiseman, Limited; weldless car brake chains, Weldless Chains, Limited; V.I.R. cables, Liverpool Electric Cable Company, Limited; special bolts and nuts for rails, Ibbotson Brothers and Company, Limited.

The Peckham Truck and Engineering Company, Limited, of 10, Coleman Street, London, E.C., have recently received orders from the following Corporations for their pendulum type trucks:—Sheffield, 50; Doncaster, 10; Warrington, 6; Derby, 10; Ilford, 16; Coventry, 5; Wallasey, 10; Southend-on-Sea, 13. Most of these are repeat orders. The company are also supplying a large number of sets of pendulum gear to convert rigid type trucks.

Edinburgh Corporation recently placed an order for large turbo-alternator plant with Brown, Boveri and Company, Limited, of Baden, whose tender was much the lowest. Other firms that tendered were as follows:—Oerlikon, Vevey, Switzerland; Escher, Wyss and Company, Zurich, Switzerland; J. Howden and Company; Daniel Adamson Company; Richardsons, Westgarth and Company, Limited; Fraser and Chalmers, Limited; British Thomson-Houston Company, Limited; Parsons and Company; Belliss and Morcom, Limited (Vickers alternators); English Electric Company, Limited; Belliss and Morcom, Limited (G.E.C. alternator); British Westinghouse Company, Limited.

Sandberg's "Insitu" Rail Hardening Process.—The Bristol Tramway Company and Bournemouth Corporation have each placed orders with Scholey and Company, Limited, 56, Victoria Street, London, S.W.1, for the treatment of two miles of track by the Sandberg "insitu" process, the latter being a repeat order. This process for increasing the durability of existing tramway rails has made rapid progress during the past nine months, and that it has passed the trial stage is evinced by the number of repeat orders placed. Messrs. Scholey and Company, as licensees and contractors, have secured contracts during this period for the treatment of close upon forty miles of track on the principal tramway systems.

WOODS GILBERT RAIL REMODELLING SYSTEM.

A Woods Gilbert machine of the latest type is now carrying out certain work on the track of the London County Council Tramways at Hammersmith. This machine is quite different in design from previous models, and it is doing the first milling work that has been undertaken with this design of machine. It is engaged on the removal of high checks and is working at an average speed of 100 ft. per hour. Previous to being transferred to the London County Council work the same machine was engaged for the past three months on the track of the London United Tramways, but its place has now been taken by one of the older type.

The Woods Gilbert Rail Remodelling Company (Strand, W.C.2) is now carrying out other contracts, including the Isle of Thanet Tramways and the Manchester Corporation. At Manchester the work consists of the removal of corrugations preparatory to treatment of the rails by the Sandberg sorbitic process. The work is being completed so rapidly that it has been necessary to transfer the machine to other sections where the sorbitic treatment is not yet being adopted. This machine removes corrugations at an average speed of about 150 ft. per hour.

PATENT LIST.

Abstracted for "The Tramway and Railway World" from the Official Journal of Patents.

***** If the inventions have been communicated the names of the communicators are given in italics.**

APPLICATIONS FOR LETTERS PATENT.

The number of the patent is given in brackets.

Reversing gears (26,647)—A. Alltree.
Differential gear (26,729)—W. L. Baynham.
Driving and transmission gear for motor vehicles (26,507)—E. W. Bowen.
Signals and alarms for motor vehicles (26,625)—E. W. Bowen.
Variable and reversing gears (26,285)—S. Boxell.
Vehicular traffic signalling apparatus (26,378)—R. H. G. Burgess.
Lifting jacks (26,394)—W. A. Chapman.
Steering gear for motor cars, etc. (26,883)—Crossley Motors, Limited, and R. H. Rose.
Maintaining lights of electric tramcars during changing over of trolley pole (26,420)—L. H. Davies.
Conductor arrangements of electric traction systems (26,837)—C. E. Fairburn.
Life-guards for motor vehicles (26,703)—F. Gregory.
Points for rails (26,461)—N. A. Krag.
Variable speed transmission gearing (26,906)—A. P. Pehrson and H. E. Watton.
Lifting jack (26,697)—H. Queney.
Power transmission mechanism for motor vehicles (26,366)—D. N Quertier.
Electrical conduit systems (26,454)—M. J. Railing.
Power transmitting and steering gear for motor cars (26,598)—Schneider et Cie.
Mechanically propelled vehicles (26,389)—H. Stanbridge.
Lifting jacks (26,425)—G. F. Steede.
Change-speed gearing for motor vehicles (26,411)—A. C. C. Walker.
Steering gear of motor cars, etc. (26,418 and 26,429)—W. Waller.
Motor vehicles (27,200)—Alldays and Onions, and A. W. Reeves.
Frame or chassis for motor vehicles (27,201)—Alldays and Onions, and A. W. Reeves.
Indicating device for road vehicles (27,554)—W. J. Archer.
Reversible or interchangeable tramway points, cross-over roads, etc. (27,049)—W. G. Armstrong.
Change-speed gears (27,576)—W. E. M. Ayres.
Tires for wheels of motor vehicles and means for mounting them (27,494)—H. E. G. Bateman and L. C. Bateman.
Cushion tires for automobiles (27,660)—G. W. Bell.
Chassis of trackless tramcars (27,471)—G. A. Bishop and R. A. Chadwick.
Electric trackless tramcars (27,472)—G. A. Bishop and R. A. Chadwick.
Splash-guard for motor vehicles (27,617)—J. Brown.
Route indicators for vehicles (27,603)—G. F. Buckle.
Spring suspension of motor vehicles (27,416)—L. F. G. Butler, Cosmos Engineering Company, and A. H. R. Fedden.
Motor vehicles (27,418, 27,421, and 27,423)—L. F. G. Butler, Cosmos Engineering Company, and A. H. R. Fedden.
Brakes for motor vehicles (27,420)—L. F. G. Butler, Cosmos Engineering Company, and A. H. R. Fedden.
Mud-guard for motor vehicles (27,243)—W. J. Byrne.
Fastener for flat-bottom tram rails, etc. (27,371)—F. M. Castleman.
Signalling devices for automobiles (27,484)—H. G. Chamberlain.
Front axles for motor cars, etc. (27,624)—J. R. Churchill.
Radiators for engines of motor vehicles (27,638)—G. Clark.
Change-speed gear (27,190)—W. M. Cunningham and Little Midland Light Car Company.
Motor vehicles (27,191)—W. M. Cunningham and Little Midland Light Car Company.
Speed and mileage indicators for vehicles (27,100)—A. J. Davies and R. Lewis.
Starting devices for engines of motor vehicles (27,014)—H. W. Gilburt.
Expanded metal track (27,229)—G. F. Greenwood.
Automatic train control systems (27,564)—R. Haddan (*J. B. Regan*).
Speed controller (27,565)—R. Haddan (*J. B. Regan*).
Liquid fuel supply for motor vehicles (27,160)—S. S. Guy.
Device for indicating direction of travel of vehicle (27,311)—H. T. Harding.
Automatic life-guard for motor vehicles (26,954)—F. O. Harwood, J. H. Harwood, and A. W. Hewett.
Automatic fender for motor vehicles, etc. (27,407)—W. Hesketh.
Prevention of skidding of motor vehicles (27,408)—W. Hesketh.
Locking device for steering gears of automobiles (27,220)—A. C. Hudson.
Lifting jacks (27,445)—Lake and Elliott, A. E. Lane, and A. D. Powell.
Variable speed gear (27,439)—R. Lindsay.
Motor vehicles (27,366)—H. Longbottom and Sykes and Sugden.
Variable speed gearing (27,491)—H. Longbottom and Sykes and Sugden.
Brakes for automobiles (27,236)—N. B. Manson and H. A. Savage.
Feed of liquid fuel to motors of automobiles (27,237)—N. B. Manson and H. A. Savage.
Trolley heads for electric tramcars (27,026)—J. Martin and F. Sharp.
Self-propelled vehicles (27,078)—J. B. Maxwell.
Bearings for motor vehicles (27,106)—H. R. Morgan, H. H. P. Seabrook, and P. B. H. Seabrook.

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Mounting of engines for motor vehicles (27,107)—H. R. Morgan, H. H. P. Seabrook, and P. B. H. Seabrook.
Control mechanism for change-speed gear (26,950)—E. Mortimer.
Emergency brake for tramcars and road vehicles (27,363)—J. Shores.
Safety device for motor vehicles (27,348)—S. Sims.
Means for lubricating wheels of motor vehicles (26,952)—C. S. Snell.
Starting devices for engines of motor vehicles (27,014)—H. Taylor.
Clutch and brake control on road vehicles (27,275)—J. G. P. Thomas.
Apparatus for controlling brakes and car doors and steps on railway vehicles (27,551)—T. H. Thomas.
Automatic safety apparatus or fender for motor vehicles, etc. (27,407)—J. L. Watkins.
Prevention of skidding of motor vehicles (27,408)—J. L. Watkins.
Steering gears for motor vehicles (27,435)—J. Weller and S. B. Weller.
Splash-guard for motor vehicles (27,695)—J. B. Wynne.
Detachable wheels for motor cars, etc. (27,707)—H. G. Allen.
Wheels for motor cars (28,055)—J. S. Andrade.
Gear boxes for motor vehicles (27,755)—J. H. Ball.
Life-guards for motor omnibuses, etc. (27,996)—J. P. Barker and C. W. Mallins.
Gearing (27,883)—J. Bedford.
Variable speed gears (27,884)—J. Bedford.
Variable speed drive (27,782)—W. W. Bird and L. W. Rawson.
Electric braking systems (28,046)—British Thomson-Houston Company (*General Electric Co.*).
Change-speed gear for self-propelled vehicles (28,065)—J. H. Chambers.
Fluid pressure braking apparatus (27,895)—J. W. Cloud.
Motor vehicle wheels (28,262)—J. M. Coplans.
Change-speed gear (27,736)—D. R. Dobson and W. Pickard.
Lifting jacks (28,350)—J. L. Edwards.
Electro-magnetic apparatus for steering vehicles (28,240)—J. G. Gray.
Road vehicles propelled by air propellers (28,136)—E. V. Hammond.
Gearing (28,077)—F. J. Healey.
Trolley head adjustment (27,834)—W. Hollingworth.
Variable speed gear (27,857)—W. Hunt (*H. Elliott*).
Vehicle direction indicator (28,290)—C. Jennings.
Guards for motor vehicles (28,271)—W. R. Kingett.
Variable speed gear (27,911)—J. Last.
Means for preventing skidding of motor vehicles (27,906)—E. Meldal.
Trolley or collector wheels for electric tramways and railways (28,029)—G. A. Mitchell and G. F. Popplewell.
Lifting jacks (27,831)—J. T. Ord.
Lifting jacks (28,252)—G. R. Phipps.
Control of motive power on automobiles, etc. (28,377)—J. Powell.
Signalling device for automobiles, etc. (28,218)—T. Riley.
Bodies for motor trucks, trailers, etc. (28,101)—Scammell and Nephew and P. G. Hugh.
Brake mechanism for motor cars, etc. (28,375)—A. V. Terry, and H. Terry and Sons.
Working vacuum automatic brake apparatus (27,929)—Vacuum Brake Company and W. P. Walker.
Trolley head adjustment (27,834)—H. S. Vickers.
Fluid pressure braking apparatus (27,895)—Westinghouse Brake Company.
Differential gearing (28,082)—A. E. White (*New Process Gear Corporation*).
Metal foundation bands for solid rubber tires (28,193)—Dunlop Rubber Company and F. J. Keegan.
Variable speed gear (28,521)—F. W. Barraclough and B. R. Wills.
Instrument for measuring and recording complete sections of rails (29,060)—E. Bayly and A. E. Langley.
Differential gear (28,508)—W. L. Baynham.
Lifting jacks (28,981)—F. de Benedetti.
Change-speed gearing for motor vehicles (28,926)—Birmingham Small Arms Company and H. Poole.
Non-slipping devices for wheels of motor vehicles (28,677)—C. A. Brandeth.
Motor lorry wheel adjustable flange (28,421)—J. Brandley.
Actuating mechanism for change-speed friction gearing (28,673)—J. W. Brotherton.
Driving and transmission mechanism for motor vehicles (28,675)—Chassis Construction Company and J. Dawes.
Variable speed gearing (29,144)—L. E. Cowey.
Variable speed gear (29,061)—R. H. Dick.
Variable speed transmission mechanism (28,773)—J. Farrar.
Lifting jacks (28,745)—G. C. Frier.
Safety controlling gear for electrically propelled vehicles (28,628)—F. Garrett and R. Garrett and Sons.
Power transmission gears (28,622)—G. Green.
Combined pneumatic jack and air compressor (28,841)—R. E. Green and F. L. Hough.
Motor vehicles (28,452 and 28,685)—J. R. Kingston and W. H. Powell.
Axles for motor vehicles (28,674)—L. Laurence.
Variable speed gears (28,426)—A. F. M. Michaud.
Wheels of motor vehicles (29,024)—J. S. Nutting.
Chassis for motor vehicles (28,752)—C. Rouquet.
Steering gear for motor vehicles (28,717)—A. Ryner and W. B. Wilson.
Chairs for tramway rails (29,020)—A. E. Sealy.
Bed plate and friction driving gear for motor vehicles (28,441)—F. Sirett.
Trolley heads for overhead electric tramcars (28,529)—L. Sunderland.
Life-guards for vehicles (29,143)—F. M. Taylor.

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TRAFFIC RETURNS.

Tramway and Omnibus Undertakings in the United Kingdom.

NAME OF COMPANY OR CORPORATION.	1918. WEEKS ENDED.					1919. WEEKS ENDED.					AGGREGATE.		
	Nov. 2	Nov. 9	Nov. 16	Nov. 23		Nov. 1	Nov. 8	Nov. 15	Nov. 22		Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Aberdare U.D. Council	499	497	457	534	...	543	534	516	570	...	33	18.202	+ 1,529
Aberdeen Corporation	2.280	2,431	2,503	2.526	...	2.899	3,081	2,914	2,811	...	24½	82.841	- 17,343
Ayr Corporation	392	377	446	372	...	463	448	431	449	...	27	20.954	+ 4.208
Belfast City Tramways	8,887	8,590	8,462	7,795	...	10.293	10,110	9,678	9,775	...	34	350.302	+ 73,965
Birkenhead Corporation	2.156	2,132	1,909	2.007	...	2,849	2.375	2.629	2.838	...	33½	98.884	+ 24,092
Birmingham Corporation	24.207	23,245	26,516	22,221	...	26.211	25,516	25,583	25,938	...	34	875.481	+ 71,978
Birmingham Motor Buses	1.369	1,270	1,483	1,221	...	1.615	1,543	1,537	1.582	...	34	59.023	+ 8.330
Blackburn Corporation	1.679	1.616	1.923	1,492	...	2.008	2.000	1.852	1,830	...	34½	80.016	+ 16,896
Bradford Corporation	10,006	8.739	8.792	8.419	...	11.248	10673	10.239	10,596	...	34	389,343	+ 73,029
Burnley Corporation... ...	2,146	2,166	2,154	2,065	...	2,899	2,978	2,700	2,830	...	—	—	—
Burton-on-Trent Corporation ...	375	374	404	357	...	497	477	471	508	...	34	17,120	+ 3,178
Bury Corporation	1,934	1,866	1,917	1,729	...	2,099	2,210	1,918	2,074	...	33½	81,638	+ 11,173
Chatham and District	1.142	1,017	971	1,032	...	1,354	1,300	1,287	1,301	...	46	69,998	- 10.068
Cork Electric	548	518	503	480	...	721	710	647	685	...	46	32,508	- 3,813
Derby Corporation	1,450	1,400	1,474	1,332	...	1,886	1,882	1,900	1,874	...	34	66.112	- 14,705
Dundee City	1,800	1,814	1,698	1,759	...	2,466	2,470	2,395	2,305	...	26½	69.177	+ 17,017
East Ham Corporation	1,390	1,471	1,666	1,529	...	1,822	1,910	1,799	1,805	...	32½	65.611	+ 13,095
Edinburgh Corporation	8,233	8,337	8,541	8,122	...	9,909	10,159	8,998	9,403	...	20½	232,450	+ 43,046
Glasgow Corporation	29,068	28,658	27,720	26,492	...	32,708	31,971	28,289	30,057	...	25	807,169	+ 90,320
Glossop (Urban Elec. Supply Co.)...	165	166	162	163	...	215	215	201	217	...	47	10.501	+ 2.067
Huddersfield Corporation	3,579	3,486	3,563	3,367	...	4,715	4,599	4,342	4,468	...	34	166.778	+ 36,735
Ilford U.D. Council	885	885	1,008*	868	...	1,131	1,067	1,044	1,060	...	33½	40.783	+ 6.878
Ipswich Corporation	625	549	669	506	...	845	806	763	786	...	34	32.186	+ 5.872
Isle of Thanet	308	255	347	269	...	544	490	444	435	...	7½	4,175	+ 1,912
Kilmarnock Corporation	268	258	302	250	...	273	262	246	279	...	27½	7 839	+ 725
Lanarkshire	3.780	3,603	3,927	2,783	...	3,902	3,831	3,676	3,145	...	46	171,188	+ 4,156
Leeds City	13.222	12,660	13.850	12,639	...	15.897	15.730	15,139	15,499	...	34	564,751	+ 109,762
Leicester Corporation	4,383	4,298	4 881	4.408	..	5,823	5,827	5,958	5,910	...	—	—	—
Leyton U.D. Council	2.286	2.210	2,594	2,273	..	2.916	2.814	2,676	2.703	...	34	106.430	+ 27.744
Liverpool Corporation	19,483	18.992	19.672	18.449	...	23.681	23.748	22,748	23,108	...	46½	1,041,845	+ 190.319
London County Council	63,240	62.538	72.624	67,134	...	76,069	75.066	74,648	74,817	...	33½	2,686.332	+ 503.430
Maidstone Corporation	248	232	274	219	...	351	330	325	326	...	33½	13.304	+ 3.625
Manchester Corporation	27,137	26,148	25.929	24,630	...	29.753	29,433	28.447	28.749	...	34	1,034.926	+ 153,951
Newcastle-on-Tyne Corporation ...	9,272	8,876	6,738	8,045	...	8.952	9,019	8,399	8,661	...	33	322.828	+ 15.177
Northampton Corporation	777	830	928	801	...	1.187	1,230	1,185	1,253	...	34	43.070	+ 13.839
Nottingham Corporation	5,562	5,406	5.768	4.795	...	7,083	7.029	6,881	6,730	...	34	242.748	+ 47.327
Oldham Corporation	3,368	3,256	3.136	3.073	...	4.169	4.211	3.944	4,204	...	33	155.444	+ 33,412
Reading Corporation	1,146	1,078	1,145	1,079	...	1,489	1,435	1,457	1,454	...	34½	53.811	+ 9,685
Rhondda Tramways	...	...	...	...	...	...	...	...	...	...	—	—	—
Rotherham Corporation	2,392	2,342	2,224	2,183	...	2.062	2,138	2,029	1,925	...	33½	70,458	- 8,092
St. Helens Corporation	...	...	...	...	...	1,577	1,536	1,487	1,393	...	7	11.211	—
Sheffield Corporation	12,625	12,630	13,231	12,458	...	15,843	15 924	15,364	16,313	...	34½	567.659	+ 101,289
Southampton Corporation	2,411	2,422	2,664	2,322	...	2,348	2,304	2,294	2,191	...	33½	90,348	+ 3,851
Southampton Motor Buses	...	...	...	...	...	161	153	149	137	...	16	2,039	—
Southend-on-Sea Corporation ...	1,029	963	1,131	1,020	...	1 397	1,299	1,326	1,306	...	34	76,885	+ 30,003
South Shields Corporation... ...	1,181	1,076	990	...	...	1,410	1,402	1,420	...	...	33	47,313	+ 8,916
Sunderland Corporation	2,296	2,298	2,100	2,034	...	2,643	2,665	2,506	2,648	...	34	98.295	+ 25,278
Swindon Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
Tyneside Tramways and Tramroads	986	916	575	863	...	943	967	948	903	...	21	25.746	+ 4.098
Wallasey Corporation	1,567	1,636	1,702	1,517	...	2,190	2,151	2,022	2,050	...	33½	87,363	+ 22,831
Walsall Corporation	1,264	...	...	1,086	...	1,549	...	...	1,556	...	34	50.040	+ 8.154
Walthamstow U.D. Council ...	1,329	1,265	1,441	1,281	...	1,539	1,493	1,429	1,510	...	34	59.070	+ 9,639
Warrington Corporation	792	792	888	786	...	910	885	886	897	...	33	29,911	+ 4,280
West Ham Corporation	4,329	4,282	4,824	4,384	...	5,037	5,047	4,824	4.928	...	33½	181,556	+ 28,765
Wolverhampton Corporation ..	1,644	1,690	1,483	1,500	...	1,882	2,033	2,088	2,207	...	34	69,593	+ 10,699

*** A number of undertakings suspended the issue of traffic returns for the duration of the war.

Colonial and Foreign Tramway Traffic Returns.

NAME OF COMPANY.	1918. WEEKS ENDED.					1919. WEEKS ENDED					AGGREGATE.		
	Nov. 2	Nov. 9	Nov. 16	Nov. 23		Nov. 1	Nov. 8	Nov. 15	Nov. 22		Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Anglo-Argentine	48.534	53,895	58.679	58.128	...	65,630	69,091	69,656	66.298	...	46	2,699306	+ 134,479
Calcutta ... ... Rs.	69,078	73,161	76,139	82.201	...	87,520	92,914	89,900	90,980	...	46½	—	+ 534,116
Madras ... ... Rs.	39,598	(2 wks.)	...	...	...	46,552	(2 wks.)	...	...	...	42	838,454	+ 40,968
Pernambuco	3,892	4,528	4,748	4,726	...	6,181	6,763	6,800	7,225	...	46½	250,497	+ 46,213

Companies issuing Monthly Statements only.

	1918.						1919.						Wks.	AGGREGATE.	
	June	July	Aug.	Sept.	Oct.	Nov.	June	July	Aug.	Sept.	Oct.	Nov.		1918-19.	+ or −.
	£	£	£	£	£	£	£	£	£	£	£	£		£	£
Ballarat & Bendigo	3,076	2.948	2.996	3.430	3,691	...	3,261	2,981	2.192	3.396	4,176	...	28	23,563	+ 41
Brazilian Trac. Mlrs	9087000	9465000	9491000	9081000	8052000	...	9369000	1007000	9734000	9792000	9980000	...	43	93,539,000	+7,757,000
Brisbane	...	36,360	42,670	35,400	...	...	...	41,610	42,245	41,970	...	...	39	346.370	+ 20,516
British Columbia	$ 488.873	413.968	544.339	575.476	...	...	411.605	642.090	667,170	684,946	...	...	13	1,994,206	+ 460,423
Buenos Ayres L'c'z.	38,375	41,145	40,006	...	41.843	42,952	61.356	45.222	45,310	...	49.692	50,635	47	237,705	+ 28,941
Burma	31,158	34,848	41,855	30.836	34.848	...	41,518	44,045	43,683	43,152	51,898	...	13	138,733	+ 31,194
Cape Town	17,612	18.409	...	...	...	...	22,432	12,792	...	19,759	...	...	—	—	—
Carthagena & H. ...	5,047	5,491	2,729	2.549	2,525	2,988	3,373	4.183	2,991	1,539	1,465	2,549	44	29,518	- 14,396
East India	1,754	1,968	1,975	1,939	2,044	...	2,323	2.687	2,761	2,831	2.855	...	13	8,447	+ 2,489
Kalgoorlie	2,747	2,798	...	...	...	...	2,646	2.815	...	...	...	...	30	18,657	- 126
La Plata	5,135	6,721	4,382	4 999	5,177	5.334	5.105	5,317	5.729	5,540	6,196	6,240	48	63,479	+ 6,653
Lima	42,161	45,964	44,720	42,838	...	...	47,811	49.025	48,923	48,780	...	...	39	429,635	+ 39,887
Manila ...	$ 183.250	189.800	200.000	204.500	...	...	160,670	189,573	193.841	223,048	...	...	39	1,833,199	+ 181,918
Monte Video ...	30.503	31,684	16.937	29,611	...	...	34,650	34,139	34,873	35,552	...	...	47	404,501	+ 57,428
Para	25,445	24,398	24,672	23,442	22,442	...	24,647	24,659	24,890	24,386	27,849	...	47	273,861	+ 9,371
Peruvian ...	$ ...	987,300	...	...	...	...	...	1058730	...	...	...	...	—	—	—
Port Elizabeth ...	5,404	3.395	...	...	...	...	4.868	3.247	...	4.372	...	...	—	—	—
Rangoon	6.163	6,054	5,760	6,067	6,566	6,611	6.276	6,562	6,472	6.812	7,679	7,379	47	73,530	+ 7,726
Toronto ...	$ 1035932	1049936	1070567	1119925	...	...	842,697	977,262	1083741	1124159	...	...	39	9.318.458	- 278,139
Winnipeg ...	$ 293,140	288,155	288,974	285,670	...	...	112,615	337,978	353,194	381,248	...	...	39	2,947.060	+ 272,923

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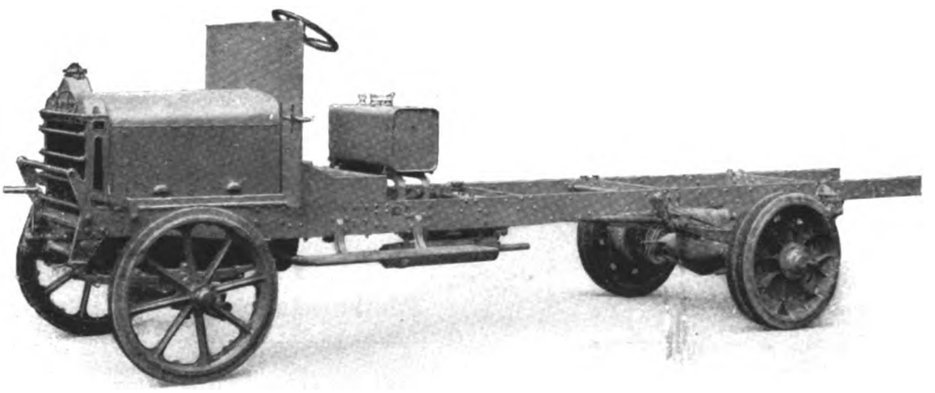

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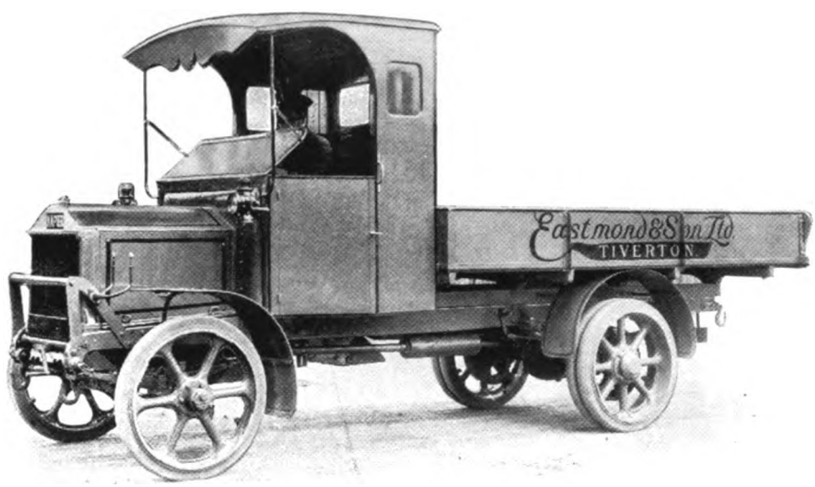

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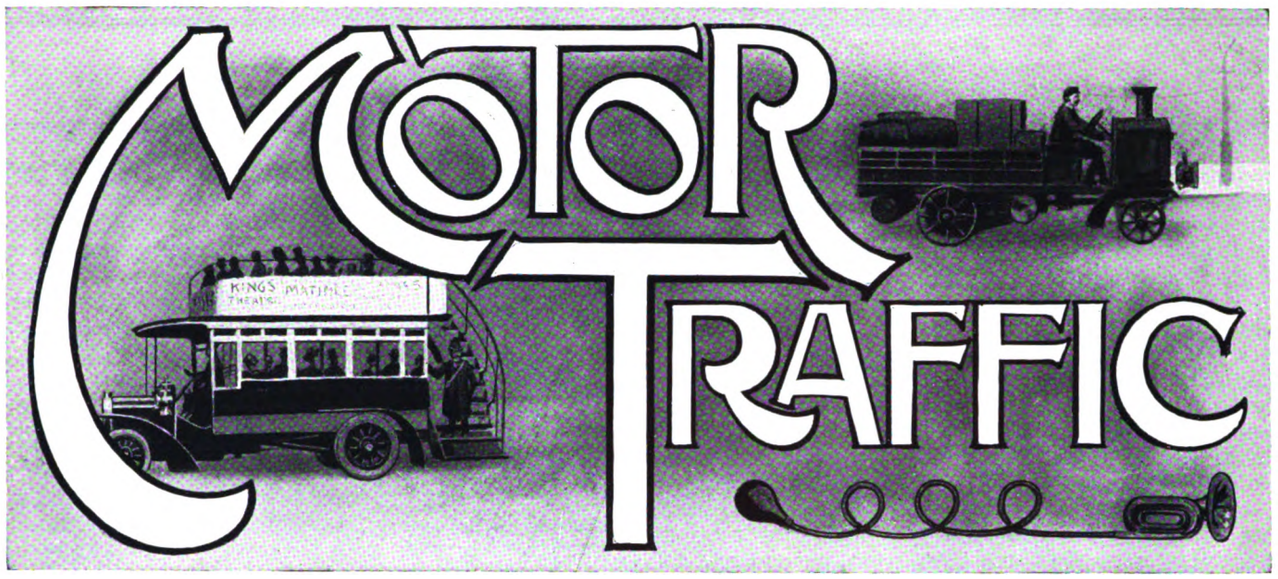

REGULATIONS FOR VEHICLES AND FOR ROADS.

Of the papers submitted during the Roads and Transport Congress that prepared by Mr. W. D. Williamson was undoubtedly among the most interesting and suggestive. One of the many points which, if not entirely novel, were put in novel form, took the shape of emphasis of the fact that whenever a vehicle is destroying a road it is pretty certain that the road is equally destroying the vehicle. Vehicle makers and users do not like bad roads, which increase the cost of running. It is hardly likely, therefore, that they will so construct and employ their vehicles as to make them unnecessarily damaging to the road surfaces and foundations. One hears plenty of discussion about laws and regulations limiting freedom of construction and use of motor vehicles, but it is seldom pointed out that if these are required we require equally legal regulations prescribing the limit of faultiness permissible in roads. As Mr. Williamson pointed out, the preservation of vehicles is just as important as the preservation of roads. The difference in the treatment accorded to the two is probably due to the supposition that the quality of the road cannot be accurately measured. If, however, the law has the right to dictate to constructors of vehicles it may equally dictate as to the methods of road construction which should be permissible. Moreover, it is not beyond the bounds of possibility to employ an instrument capable of measuring the undulations caused by passage over a given road at a given speed. If the results of these measurements showed the roads to be unduly bad those responsible for them could be required to put in hand the work of repair. One does not seriously suppose that any application of such a principle as that just suggested is probable. At the same time road engineers should remember that as they themselves would resent dictation on such points, so they ought to be chary of imposing upon vehicle engineers superfluous regulations often needed only to bolster up an obsolete road system, which is far more responsible for its own destruction than are the vehicles which work upon it.

HORSED OR MOTOR TRAFFIC?

Mr. A. E. Brookes, County Surveyor of Durham, in his paper before the Congress, stated the view that separate carriageways will presently have to be provided for motor vehicles on all arterial roads. This statement has rather the appearance of indicating that a subsidiary system of roads should be supplied for motor traffic, the existing system being primarily reserved for horsed traffic. Quite a different impression was conveyed by Sir Eric Geddes in his speech prior to the opening of the Congress. The Minister of Transport made it clear that in his view expenditure on road improvement must now aim mainly at making all our principal roads really well suited to carry motor traffic. He admitted that for a time we must still take some account of the claims of the horse user, particularly in agricultural districts, though it might well be that before long the horsed vehicle even on the farm would be a thing of the past. He hoped that some means would be devised to provide temporarily for horsed traffic either alongside the road or by allocating certain roads to it. The interesting point about this comment is that it indicates a complete reversal of the old idea still maintained in some quarters, and apparently by Mr. Brookes. We have often heard it proposed that special roads should be built for motor traffic, the assumption presumably being that motor traffic could only exist by tolerance on the ordinary road system. It is a new thing to have propounded by a Cabinet Minister the theory that the main roads belong to motor traffic and horsed traffic must be accommodated elsewhere. It is, however, only logical if, as apparently is the case, the users of motor traffic are to be asked to make a substantial contribution towards road improvement and maintenance while the users of horsed vehicles are to remain practically exempt. On this question of taxation Sir Eric Geddes has been a little bit vague in his phrasing, though probably he is not at all vague in his intentions. He means the user of the road to contribute solidly towards road maintenance and improvement, but directly he goes on to elaborate this intention, he begins to talk about the taxation of motors as though motors were the only users. The inference is that other users are regarded as negligible for taxation purposes. The excuse for so regarding them is now put forward for the first time, and apparently consists in the admission that the money expended on road maintenance must go to make the roads better for mechanical transport but worse for horsed transport, which therefore could hardly be expected to contribute towards work done deliberately to its detriment.

A GLANCE BACK AT OLYMPIA.

Unquestionably the things which struck the public most in connection with the Olympia Show were the

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tremendous crowds attracted, the huge excess of demand over immediate supply, and the numerous, and in some cases substantial, increases made in the retail prices of vehicles. This last led to a great deal of discussion in the Press and a good many accusations of profiteering against the motor industry. Incidentally a fair judgment was rendered more difficult in view of the fancy prices which some people undoubtedly paid for immediate delivery of cars. These premiums were, however, merely private bargains between individuals, and the industry had nothing to do with them. It was well, nevertheless, that the British motor manufacturers took the precaution of making a comprehensive public statement of their position, and difficulties, and of definitely rebutting accusations of profiteering. Mr. Underdown, speaking as President of the Association of British Motor Manufacturers, stated authoritatively that his association has, with expert assistance, examined in detail figures supplied by a considerable number of representative firms, as a result of which he was able to state that the average percentage increase in price was not nearly equivalent to the average percentage increases in cost of production. The various raw materials from which the motor car is mainly constructed have been increased in price from two to three and a half times. The cost of labour has been more than doubled. Administration expenses have gone up in like proportion, but despite these facts the average increase in price appears to be somewhere in the neighbourhood of 70 per cent., which, under the circumstances, cannot be regarded as unreasonable.

CO-OPERATION AND STANDARDISATION.

The industry has also been accused of failing to appreciate the advantages of co-operation and standardisation, but here again a strong case can be and has been put up for the defence. Standardisation is only good provided that it is not carried to an excessive point. Too much standardisation means stagnation in the development of design. British industry is moving rapidly in the direction of standardisation carried to the limits desirable in view of the circumstances. The output of factories has been increased. The number of models turned out has been reduced. Thus we get a much larger quantity output of the standard models manufactured. The Manufacturers' Association has committees at work arriving at standards for various components and accessories which it is thought can advantageously be made common to all British commercial vehicles. The adoption of such standards would also mean the production of the standard parts in very great quantity, and therefore presumably on the most economical lines. As regards co-operation, there have, of course, been many actual amalgamations completed in the British industry, while others are to be anticipated. Without going so far as financial amalgamation, there are other forms of co-operation that have not been neglected. British manufacturers now meet frequently and exchange their ideas and experiences freely. They have co-operated in sending out a commissioner to study oversea markets, advising on their possibilities and the best ways of doing business in them, and particularly as to co-operative measures which manufacturers might advantageously adopt in this connection. They have formed a Research Association for co-operative research in the form of big basic inquiries into matters underlying the design and construction of motors. In both of these two important industries the motor industry has been the first branch of engineering to take advantage of the new attitude of the Government in which financial and other support is offered to industries, the members of which co-operate in these ways.

IS THE BRITISH INDUSTRY STUPID?

There is yet another type of accusation frequently made directly or indirectly against the British industry, but deserving perhaps of less consideration than the others. It takes the form of the suggestion that the industry lacks energy, foresight, and, in fact, brains. A sufficient answer is to be found in the war record of this industry, which was well summarised by Prince Arthur of Connaught, Sir Hamar Greenwood, and Sir Arthur Stanley at the annual dinner of the Association of British Motor and Allied Manufacturers. Probably we are all willing to agree with them that the industry showed during the war great powers of organisation and adaptability. The diversity of its war-time products and the promptness and dimensions of its deliveries amply prove the accuracy of this statement. Now we have the industry working primarily for profit instead of working primarily for patriotic reasons and having to return the great bulk of its profits to the Government. The accusation of stupidity and lack of energy therefore assumes that either the leaders of the industry have suddenly lost the brains which they unquestionably possessed during the war, or else will not trouble on their own behalf to use the brains which they freely applied for the benefit of the country. The argument is in fact altogether unreasonable.

OMNIBUS TRAFFIC CONTRIBUTIONS.

The Local Legislation Committee of the House of Commons have passed the omnibus powers clauses of the Walsall Corporation Bill on the terms offered by the Corporation to various local authorities through whose territory they propose to run omnibuses. The terms are £700 per mile for reconstruction of roads, and ¾d. per omnibus mile for road maintenance. The scheduled routes comprise 43½ miles, of which 38¼ are outside the borough. The clauses were opposed by Staffordshire and Warwickshire County Councils, and Sutton Coldfield Corporation.

Sir W. Middlebrook, chairman of the committee, in giving the decision, said that the questions of road contribution, both for adaptation and for maintenance, had become national questions, and they ought not to have to be considered by different committees applying to different Bills, except so far as circumstances in different localities varied, causing variation in those amounts. With some amount of difficulty, they had come to the conclusion that the sum offered of £700 for adaptation was a reasonably fair sum, and they approved of it, and that the maintenance, which they said with perhaps not so strong an emphasis, in these cases should be ¾d.

In the Walsall Act of 1914, the sum of £275 per mile was allowed for road reconstruction, and ¾d. per omnibus mile for road maintenance.

The agreement of Wolverhampton Corporation with Tettenhall Urban Council for payment of ¾d. per omnibus mile for road maintenance on routes traversed by the Corporation's omnibuses has been renewed for three years, and thereafter subject to three months' notice on either side.

On payment of 3d. per mile by the National Steam Car Company, Bedford, the Northampton County Council have agreed to the institution of an omnibus service between Bedford and Rushden.

Rotherham Rural Council have refused a request made by Rotherham Corporation to waive the provisions of an agreement entered into in April, 1917, under which the Corporation are to pay £140 per annum for five years towards the expenses of repairing the roads used by the Corporation omnibuses.

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ROADS AND TRANSPORT CONGRESS AND EXHIBITION.

Sir Eric Geddes on Government's Road Policy.

Classification Scheme Ready by Midsummer.

The Roads and Transport Congress and Exhibition (organised by the County Councils Association) at the Agricultural Hall were declared open on Thursday afternoon, November 20, by Brigadier-General Sir H. P. Maybury, Director-General of Roads. General Maybury, who was called on at the last moment to perform the opening ceremony in place of Sir Eric Geddes, said he had asked that as a matter of urgency the congress should consider how best the conflicting interests of the horse and the motor on the roads could be reconciled.

Sir William Joynson-Hicks, M.P., in proposing a vote of thanks to General Maybury, prophesied that in ten years the only horse traffic left on the roads would be the heavy agricultural traffic, and that it would be cheaper for the County Councils to build special soft roads for horse traffic, leaving the hard dustless roads for the motors.

Prior to the opening of the congress and exhibition, a luncheon was given by the County Councils Association at the Holborn Restaurant. The principal guest was Sir Eric Geddes, and in a speech he indicated the Government's policy in regard to the future of the roads of this country.

The Earl of Dartmouth, President of the County Councils Association, presided, and among the large gathering were :—

Sir Eric Geddes (Minister of Transport), Lord Montague of Beaulieu (Chief Mechanical Referee of the Government of India), the Right Hon. H. Hobhouse (Chairman of the County Councils Association), Sir W. Joynson-Hicks, M.P. (Chairman of the Automobile Association and Motor Union), Sir W. Ryland D. Adkins, M.P. (Vice-chairman of the County Councils Association), Sir Edgar R. Bowring (High Commissioner for Newfoundland),the Hon. E. Lucas (Agent-General for South Australia), Mr. Kennedy Jones, M.P. (Chairman of the Metropolitan Traffic Committee), Sir J. A. F. Aspinall (President of the Institution of Civil Engineers), Mr. F. Dent (Chairman of the Essex Highways Committee), Sir Gregory Wade, K.C. (Agent-General for New South Wales), Brigadier-General Sir H. Maybury (Director-General of Roads), Sir Kenneth Mackenzie, Bart. (Chairman of the Association of the County Councils of Scotland), Sir A. Griffith-Boscawen, M.P. (President of the National Traction Engine Owners' and Users' Association), Sir J. S. Harwood-Banner, M.P. (President of the Association of Municipal Corporations), Major-General Sir Philip Nash (Director-General of Transportation), Sir Thomas Mackenzie (High Commissioner for New Zealand), Mr. T. Gautrey (Deputy Chairman, London County Council), Lord Roe (President of the Urban District Councils Association), Sir A. W. Chapman (Surrey County Council), Mr. W. Rees Jeffreys (Deputy Chairman, Motor Legislation Committee), Mr. F. Lanchester (President of the Society of Motor Manufacturers and Traders), Mr. Andrew T. Taylor (Vice-chairman of London County Council), Mr. J. Aspell (Chairman of Lancashire Main Roads Committee), Sir H. G. Fordham (Cambridgeshire County Council), Mr. F. H. Berryman (Chairman of Somerset County Works Committee), and Sir Douglas Newton (Chairman of Cambridgeshire County Council).

The Royal toasts having been proposed and acknowledged,

The Chairman proposed "The Ministry of Transport." He believed in full and open exchange of opinions between the bodies concerned with the highways of the country. No one questioned the deterioration of the roads, but there was a doubt as to how long it would take to restore them, how much they would cost, and who was going to pay. The speech made a few days previously by Sir E. Geddes, to the Society of Motor Manufacturers, was full of hope. Sir Eric indicated the necessity of a proper classification, that all through roads should be maintained at a proper standard, and that the cost should not come entirely out of the pockets of the taxpayer, but that a reasonable contribution should be made by those who used the roads. (Hear, hear.) Any man who secured a reasonable contribution to the upkeep of the roads by the users of mechanical transport, and by that he meant a fair return for damage done, would be regarded as a public benefactor by the County Councils Association. They had obtained from the Government a separate department for the roads, and the County Councils would do what they could to help that department.

In the part of the country in which he (the chairman) resided, there were still a good many people who believed in that archaic animal the horse (laughter), and he begged the Congress to remember in their deliberations that mechanical transport was not the only means of conveyance on the roads. They expected great results from the congress. He had the greatest possible pleasure in asking them to drink to the health of "The Ministry of Transport," and he coupled with it the assurance that they would all do their best to make it a great success. (Hear, hear, and cheers.)

Intentions of the Ministry.

Sir Eric Geddes, who was cordially received, said : I have to thank Lord Dartmouth very much for the kind way in which he has proposed, and you gentlemen have drunk, my health and the health of the Ministry of Transport. It is a great honour to me to stand here as the president of the congress and exhibition which you have promoted, and also it is a great pleasure to myself and to the officers of the Ministry of Transport who are here to learn from your remarks, sir, that we may look, as I think we have reason to hope that we should look, to the County Councils Association for co-operation and help in the work which we have to do together. Although during the passage of the Transport Bill—the Ministry of Ways and Communications Bill, as it was called then—we did not always see eye to eye with some of our friends, I must say this and acknowledge very gratefully the helpful way in which the representatives of the County Councils Association always spoke. Their criticism was always constructive and always helpful, and I am glad that we managed in the end to see completely eye to eye in the Bill as it was passed. I hope now that not only the County Councils Association, but also some of the others who took great interest in the Bill when it was going through the House, will realise that their fears have been unfounded. Not very long ago one of them, Sir Joynson-Hicks, indicated that I was now sufficiently keen to be admitted to the society of road users. (Laughter.) The Government realises very fully the debt that they owe to the County Councils Association, and to the other local authorities for their activities, and I think that probably there is no sphere of their activity which has been more successful than in the improvement and maintenance of roads within the means at their disposal—roads, highways, and bridges. This Association, I believe, controls some 28,000 miles of important main roads, and in spite of the strain and difficulty of the past five years, it must be a satisfaction to the country to know that your roads are believed to be, and are reported to me to be by experts, second to none that are seen in any other part of the world. Certainly they are second to none that I have seen ; but we have got to look ahead. (Hear, hear.) I feel that the roads have a great future before them, if we can only make them what their future demands. The new era for roads began with the passing of the Locomotives and Highways Act in 1896, and since then you have had an ever-increasing number of mechanically-propelled, fast-moving, and heavy vehicles on the road. The requirements of that traffic have been met not as well as some of us would have wished. Now conditions are changing. In 1909, when the Road Board was started, a step was taken in the direction of improving roads and making them not only a local concern, but a national concern, at the same time leaving the actual work in the hands of the local authorities. That decision was right, and the work should continue to be left in the hands of the local authorities as it is to-day, but as mechanical traction develops there should be an increasing contribution from central funds. That is what your chairman has mentioned, and I feel that it is right. It is also the view of the Ministry of Transport and, as far as one can say, it is the view of the Government. But the money is a very important thing ; where are we going to get it ? We are a poor country. The cost of roads, as you know, has gone up enormously. The remarkable thing that I see, coming to this problem afresh, is that the additional cost in the building of roads does not mean a decreased up-keep ; the more expensive the construction of the roads on the figures given to me, the more expensive the annual maintenance, and that is a thing that is unlike most kinds of expenditure of that kind. We have to bear not only increased capital but increased maintenance as well. We have to get money before we can improve the roads as the needs of the country really demand. I think myself that while in 1913 we might have looked to the Exchequer to provide that money out of general funds, that is now impossible, and we have now got to look to some other source. I have not, and I ought not to have, any clear definite idea as to how the money is to be raised.

Problems to be Solved.

At present the question of the taxation of the users of the roads has been referred to one of the Committees which I have appointed under the Ministry of Transport Act. They are considering that question. Motor users showed a broad and wise outlook when they accepted the petrol duty and the motor licence tax, provided the money was spent on the roads. That is the principle we should maintain. I am against tolls ; that is fundamentally wrong. I think the users of the roads should pay on two grounds—one is the damage they do to the road ; the other is the amount of use they get out of the roads. I hope that the Committee will conduct its investigations somewhere on these two bases or upon a combination of them. If, as I believe, we stand on the outskirts of the beginning of a new era in the history of the roads, it is because we gained during the war far more knowledge of motor traction on the roads than we ever had before as a nation. There is no doubt the events of the last five or six years have taught us far more than we ever knew about mechanical traction. The road problem to carry that heavy traction has got to be solved, and nothing can be more valuable to its solution than this exhibition and congress, which at the initiative of the County Councils Association we are inaugurating to-day.

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Roads cannot be built by simply throwing down stone and rolling it in; it requires scientific study with education and with exchange of ideas, which can only be brought about by a congress such as this one. We must endeavour to adopt methods of using the roads which will not deteriorate them to a greater extent than is necessary. We must make the surface of the roads fit for the vehicles that have to travel over them. The expenditure on roads is enormous. The ratepayers provided £18,000,000 in the year before the war. This year, I am told, it is estimated that it will be £23,000,000, which with the Government contribution—a contribution in arrears for petrol duty which was taken from the roads for war purposes—means that £33,000,000 will go to the roads this year. This is a very large sum. If, by scientific study and education, improved methods can be obtained you have a very large sum to work on, but I think that sum has to be exceeded. The road transport in the country should work, as I see it, on specially allocated roads. Whether the horse has to be kept off those roads, or whether he is to be provided for alongside the road, I do not know, but the horse, that wants a rough and soft surface to keep his feet, and the motor, that wants a hard surface, are incompatible. I do not think you can join them. The horse user is rather like a body of people in my own Country—Scotland—who do not move with the times and get out of touch with things, and in the end are called "Wee Frees." I am not talking of political "Wee Frees"—(laughter)—but the horse user is entitled to consideration, and I was very glad, sir, that you mentioned in your remarks that consideration was due to the horse user, particularly the farmer, though it may be that before long the horse on the farm will be a thing of the past. I hope therefore, whether at this congress or afterwards, that some means will be devised to provide for the horse traffic. Transport has come into its own domain in the last eighteen months in a way it was never appreciated before, and it is of great significance that your exhibition to-day is a transport exhibition as well as a roads exhibition. Transport and roads, transport and rail, and transport and water are one and an indivisible whole. You cannot consider roads without considering the transport on them, and I take it to be of great importance that you should have put the word transport into the name that you have given to your exhibition. Until recent years few people have recognised what an enormous power transport is in the life of a civilised community.

One of a Fleet of 32-Seated Leylands for Edinburgh Corporation.

A New Conception of Roads.

It is not very many weeks ago that we realised what a valuable thing roads were to the life of a community. I hope that lesson will never be forgotten. If the country and the House of Commons remember that lesson, it is going to make my task a great deal easier. I think I would like before sitting down to mention a debt that the British army and Lord Haig, and I myself, when I was Director-General of Transport in France, owe to the local and highways authorities for what they did to help the army in 1916 in France. You gave us readily without dispute, without making conditions, all your officers and your men, and your plant. Without that it would have been impossible for the Government to have given the army the finest roads that any Army had. I would like to thank you here as heartily as I can and from the bottom of my heart for what you did for us then. Good roads were necessary in war; they are no less necessary in peace. (Hear, hear.) I think we have got to get a new conception of roads. Classification is the first step towards improvement. We believe that the consultations which we are to have with the local authorities will be helpful and that we will be able, so I am told, to have a scheme of classification ready not later than midsummer. That will form the basis of a new policy, and will mean a new era and a new future for roads. When that classification has been carried out and agreed, you will find that at any rate from the Ministry of Transport you are having the fullest support and help, and I believe we will be able to get your assistance and the assistance of other societies in carrying out that scheme of road reform which will be based upon that classification which is so essential. (Cheers.) I should like to say how very sorry I am that owing to something that has arisen in the House of Commons I have to go there this afternoon, and I am to be denied the pleasure of going to the opening of the exhibition. But I certainly hope to be there before it is closed. I would like, gentlemen, to thank you again for the very kind way in which you have drunk to the success of my department. (Cheers.)

THE EXHIBITION.

In opening the exhibition, Sir Henry Maybury said that the roads must be made fit for mechanical traffic, but regard must also be paid to other users. The difficulties of the problem were recognised by all, and he was sure that those who had promoted the exhibition would do something towards its solution.

The exhibition was well attended, and the exhibitors appeared to be gratified with business actually done and with the number of enquiries from visitors whose attendance should sooner or later lead to practical results. The whole of the ground floor was occupied with exhibits relating to mechanical traction and scavenging machines, together with road making. The galleries contained an interesting collection of public works exhibits, including many displays of importance in view of the urgency of the housing problem. The traction stands were mainly of interest to municipal and other public authorities. Some regret was expressed that public passenger vehicles did not find a place; but there were two good reasons for their absence. One was the lack of space; the other is that every omnibus that can be sent out from the works is on order for delivery. Exhibits in the roads and transport section were made by 69 firms, and in the public works section there were 53 stands. The Organising Committee was presided over by Mr. F. Dent (of the Essex County Council), Mr. S. M. Johnson being the secretary, and Mr. A. F. May again acted as business manager.

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Subjoined are brief notices of most of the principal exhibits.

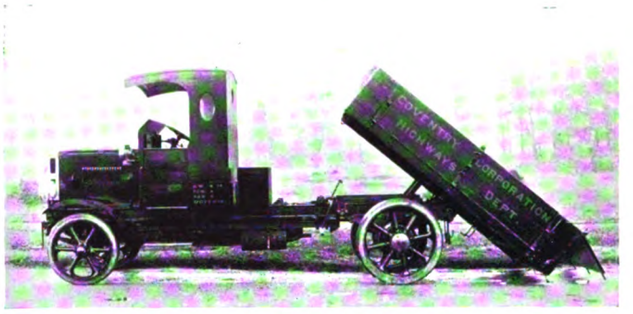
Leyland Motors, Limited, Leyland, Lancs.—A fully-equipped 500-gallon motor fire engine made for Finchley Fire Brigade represented an exhibit which is in use by the London County Council and many municipal bodies. The Rees-Roturbo pump with which the machine is fitted gives a delivery of 350 gallons per minute, and there is an extending ladder. The engine is of 55 h.p. A new type 5-ton steam wagon was also shown; this had a tipping body

Leyland 5-ton Steam Tip-Wagon.

operated from the engine. Outside the hall was a single-deck 32-seat omnibus of 40 h.p., one of a fleet for Edinburgh Corporation. The body has two divisions, the rear one for smokers. A feature of the exhibit was the handsome mahogany fittings, which comprise the stand, sign, and revolving show cases, upon which photographs were mounted. Many of these photographs were of exceptional interest, and depicted Leyland machines in various parts of the world in a wide variety of service.

Guy Motors, Limited, Fallings Park, Wolverhampton.—In the general appearance of the body, as well in the excellence of the details of the chassis, the single exhibit of a 2-ton vehicle on this stand was an attraction that few failed to notice. The tip-up wagon body is hand operated on a twin screw from either side, and its completeness was enhanced by the driver's cab. The chassis dimensions are—height at rear 2 ft. 3½ in., wheel track 5 ft., ground clearance 10 in. By means of underslung springs at the rear the body is kept low. A feature of engine and chassis is the ease with which every detail can be got at. There are four speeds forward and a reverse, and the engine is of 20 h.p. The machine does ten miles per gallon when fully loaded.

Clayton & Shuttleworth, Limited, Lincoln.—Here was seen a 5-ton steam wagon for Chesterfield Rural Council, which will haul that load on its own body at a speed of eight miles per hour when fitted with rubber tires. It can further haul a trailer carrying three tons at a speed of five miles per hour. The boiler is an overtype compound, working at 200 lb. pressure. The wheels are of this company's interchangeable type, enabling rims and tires to be removed and steel tires substituted. The end-tipping body can be

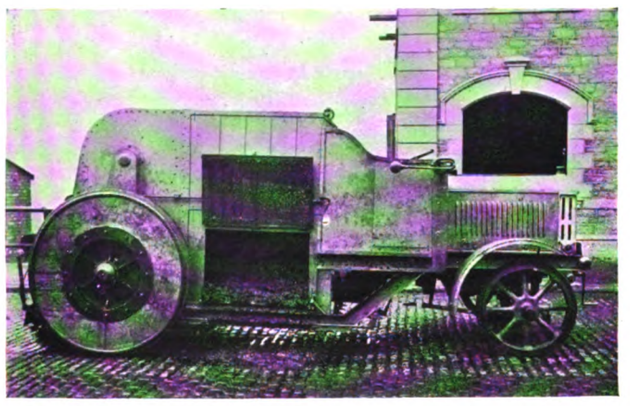


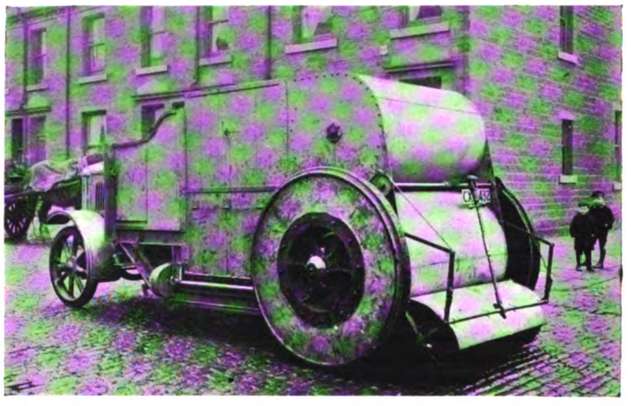
Maudslay 5-ton Wagon for Coventry Corporation.

operated either by hand or mechanically by the driver in his cab, the drive being from the end of the crank shaft through bevel gears to a pair of vertical screwed shafts with swivel nuts.

Maudslay Motor Company, Limited, Parkside, Coventry.—An end-tipping wagon mounted on a 40-h.p. chassis was remarkable for the body being divided into four compartments, each for carrying one ton of coal. A 5-ton end-tipping wagon also has a 40-h.p. Maudslay chassis. This chassis is noted for its accessibility. The wagon is to the order of Coventry Corporation Highways Department. Both vehicles have a covered seat for the driver. Tipping of the bodies is by two longitudinal screws. Each chassis has double reduction drive.

Clayton and Company (Huddersfield), Limited, Karrier Works, Huddersfield.—The successful road sweeper and collector exhibited is one of a type discharging triple duties in numerous towns to the great advantage of the ratepayers. It is operated by a 35 h.p. engine, and has speeds of 3, 5½, and 8 miles per hour, with reverse of 2½ miles per hour. Its capacity is 4 cubic yards of road refuse (about 3 to 4 tons). The tank holds 120 gallons of water, sufficient for sprinkling 100,000 sq. ft. of road. Then two brushes come into operation over a width of 7 ft. 6 in., when a third brush sweeps the refuse into the conveyor, from which it enters the hopper.





Clayton Combined Sprinkler, Sweeper, and Refuse Collector.

Ransomes, Sims & Jefferies, Limited, Orwell Works, Ipswich.—The chief exhibit was a 3½-ton Orwell electric tipping-wagon. It is propelled and tipped by motors driven from batteries, there being a separate motor to each of the wheels. By means of the regenerating system the energy used at top speed for braking the wheels also serves to charge the accumulators. Tipping can be accomplished in 40 secs. The vehicle is to be used for refuse collection by Cardiff Corporation. This firm also make a specialty of a 3,000-lb. electric industrial truck, equipped with portable pneumatic outfit.

British Four-Wheel Drive Tractor Lorry Company, 1-3, Brixton Road, S.W.9.—The four-wheel drive motor wagon was tested by the War Department with satisfactory results during the war, and it is now being adopted for civil use. It had been in every day use in the United States prior to the war, and this British company's vehicle is filling the demand here for a machine with greater tractive pull than is the case with the rear drive. The 3-ton chassis shown was fitted with a body divided into sections so that separate loads of loose material can be carried, and by a small device can be

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unloaded by one man. The machine will also haul, in addition to its own load, a trailer with a 5-ton load.

EDISON ACCUMULATORS, LIMITED, Duke Street, St. James, S.W.1.—The well-known electric tipping wagons made at Birmingham was shown in the 5-ton type. The exhibit was built for Glasgow Corporation. On level roads it travels 35 miles on one charge at an average speed of eight miles per hour, but will ascend any gradient.

JOHN THORNYCROFT AND COMPANY, LIMITED, 10, Grosvenor Place, S.W.1.—The Thornycroft 40-H.P. type "J" tip-wagon exhibited is similar to that daily seen at work in the Cities of London and Westminster collecting road and house refuse and conveying it to the shoots. Ten more are on order for the last-named Council. The body has high sides, and the driver is completely sheltered. There is a hand-operated tipping gear. The body is interchangeable with a 750-gallon watering tank.

JOHN YATES AND COMPANY, LIMITED, of Aston Manor, Birmingham, had a complete collection of tools and appliances required for

Familiar London Scavenger—The Thornycroft.

the construction and upkeep of roads, tramways, and railways, of many of which they have been manufacturers since 1804. Their display included shovels, grafting tools, picks, mattocks, road and other wedges, hammers, crowbars, and chisels of various types. They also showed one of their 200-gallon "Setay" Tar Sprayers, ten of which they have supplied to the Road Board for the upkeep of military roads. This machine is shown complete with derrick for raising and lowering tar barrels and is mounted on special self-oiling wheels to ensure quick and easy traction. In addition there is a collection of special tar spraying cans and buckets as well as ordinary galvanised types, whilst the collection of danger lamps, screens, riddles, barrows, and hand carts includes everything of that kind necessary for public work. A collection of tramway tools was also shown. These included the firm's rail carrier with solid plate wheels, rail tongs, rail jacks, jim crows, rail spanners, and levers.

TUKE AND BELL, LIMITED, Carlton Engineering Works, Lichfield.—This firm are the manufacturers of the "Constable" patent tipping wagon. They exhibited a sample of this popular vehicle, together with a sleeping van designed to give accommodation for a gang of road men when working away from towns. The tipping body is operated by a screw which causes the body to travel to a point at which gravity completes the operation. The tipping angle reaches a maximum of 50 degrees and the time taken to complete is 90 secs.

R. A. DYSON AND COMPANY, Grafton Street, Liverpool.—A new British designed trailer, claimed to be the only automatic tipper, was shown on this stand. The tipping arrangements are such that the operations of tipping and righting the trailer again when the load is discharged is performed by the movement of the fore carriage, the time taken being three minutes.

CARROSSERIE LATYMER (1915) LIMITED, Walmer Road, London, W.—This firm of coach builders exhibited an example of their "Carrimore Trailer." The vehicle, which is constructed entirely of steel, was fitted with a hand-operated tipping body. A large number of these trailers have been supplied to the military authorities, and the makers have received satisfactory reports as to their durability and efficiency under very trying conditions.

BRITISH LEON COMPANY, Bush Lane House, E.C.—The company showed machines (for hire on a royalty basis) which produce a hollow concrete brick. By reason of its scientific design this form of brick possesses many advantages, among them being saving of time and labour, rapidity and adaptability in building in. In one month eleven millions were supplied to the French Government.

GLEDHILL BROOK TIME RECORDERS, LIMITED, Huddersfield.—The exhibits were time-recorders and other supplies appertaining to time-checking, notably workmen's time recorders, production cost recorders, tell-tales, wages cups and trays, time, cost, and wage-paying systems.

HERBERT FROOD COMPANY, LIMITED, Chapel-en-le-Frith, Derbyshire.—Ferodo friction lining, which is used as the most efficient form of brake and clutch lining, was also shown in the following forms:—Stair treads, friction wheels, and for brakes and clutches for all types of machinery and hauling gear.

LACRE MOTOR CAR COMPANY, LIMITED, York Road, King's Cross, N.—The Lacre road sweeper, a combined lorry and tipping wagon-water cart, a standard tipping wagon, and a tower wagon were shown. The road sweeper not only sweeps a width of 7 ft. 6 in., but is fitted with nozzles in front, from which a spray of water is directed upon the road. The brush can be applied with varying pressure, and the wheelbase is reduced by only three wheels being fitted.

DENNIS BROTHERS, LIMITED, Guildford.—The exhibit on this

Dennis Tower Wagon for Tramways.

stand comprised a street watering tank of 750 gallons capacity mounted on a Dennis 40-H.P. chassis and fitted with Warwick sprinkling gear. An end-tipping wagon of 3-4 ton capacity; a fine example of a vehicle extensively used by local authorities and contractors. A tramway tower wagon on a 40-H.P. petrol engined chassis which can be operated by one man. The extended height of this from platform is 19 ft., the closed height being 13 ft. 10 in. The Dennis motor turbine fire engine also attracted frequent inspection. The four-cylinder engine is rated at 60 H.P., and the pump has a capacity of 450 gallons per minute at low pressure. The chassis carries a first-aid combination and a Bayley escape 50 ft. long.

H. G. BURFORD AND COMPANY, Regent Street, W.—The 29-H.P. Burford chassis, listed at £695, has a net carrying capacity of two tons. A feature of this machine is that it has a double rear axle, one sustaining the load and the other the drive. The gearing gives four speeds and a reverse. The up-to-date nature of the construction is shown by engine, clutch, and gear-box being of unit type, with three-point suspension, and dry plate clutch. Water cooling is by centrifugal pump. A special show was made of the C. W. Stamper loading truck, for use with the Burford chassis. The body is detachable and is mounted on a skeleton frame. This can be backed up to the lorry chassis and run off by one man by means

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of a hand winding gear on the chassis. With several of these trucks available, a considerable saving of time and labour is assured. A tipping apparatus is provided.

40-h.p. Dennis Watering Tank of 750 gallons.

ALBION MOTOR CAR COMPANY, LIMITED, Scotstoun, Glasgow, and 21, Upper Rathbone Place, W.—The single exhibit was proof of keen realisation of what local authorities and business firms have been clamouring for during the past two years—a wagon suitable to the use of both of those interests. It is a vehicle to take a medium load, and of sufficient H.P. to give good speed. In the case of the Albion 3½-ton steel tipping wagon the H.P. is 32 from a four-cylinder engine. The company remain true to their practice of fitting a speed governor (Albion-Murray), which prevents drivers racing the engine, a failing that adds to wear and tear of the vehicle. There are three forward and a reverse, the standard being 12 miles per hour. Tipping of the load is by a patent hydraulic gear, and it can be done in 1¼ minutes, while the body is returned to the horizontal in 45 seconds

STRAKER-SQUIRE, LIMITED, Edmonton, N.18.—A striking example of the use to which the motor engine can be put is illustrated by the vacuum gully cleaner with which this firm have been reducing scavenging costs during the past few years. The machine, which

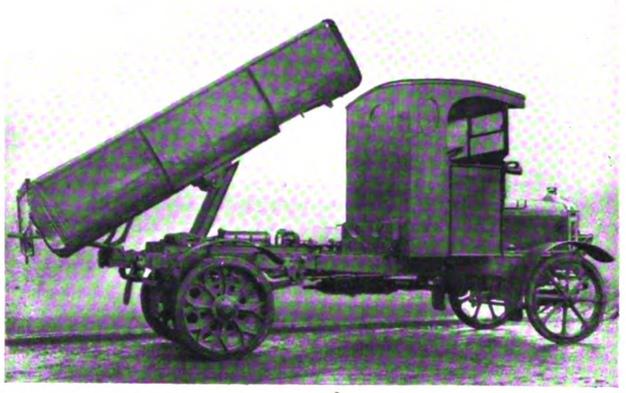
Straker-Squire Gully Cleaner on 5-ton 50-h.p. Chassis.

is mounted on a 5-ton 50-H.P. chassis, extracts mud and refuse from street gullies, catch-pits, etc., and deposits it in a cylindrical tank of 3½ tons capacity. The tank is inclined towards the rear, where there is a large door, which is opened by means of trip gear when the tank has to be emptied. A 5-ton chassis is also utilised for the firm's 1,100 gallon street watering machine. This is fitted with high pressure water jets, and special rubber squeegee, the latter wiping water and mud from the road. Adjustable sprinkler nozzles covering up to 40 ft. in width are also fitted, together with a gravity nozzle for flushing channels and gullies. A third exhibit—a 5-ton wagon on a 50-H.P. chassis—has tipping gear (Constable's patent) enabling one man to tip the body to 50 deg. in two minutes.

ASSOCIATED EQUIPMENT COMPANY, LIMITED, Walthamstow, E.17.—The company are obtaining for their specially equipped wagons for commercial and industrial use as high a reputation as their omnibuses have secured in London and elsewhere. One such wagon was shown on a 40-H.P. chassis. This had a metal body capable of taking four tons of broken stone. By means of built-up sides a more bulky load can be accommodated. The engine is a Tylor, and the body is manipulated by Bromilow and Edward's hydraulic tipping gear. This is driven from the engine, but there is an alternative system by means of friction drive of the engine flywheel. A 4-ton load can be tipped in 20 seconds. Another exhibit—the A.E.C. capstan—is used by brewers and others who have to draw heavy items on to their lorries. Up to one ton at a time can be dealt with.

5-ton Tipping Wagon by Straker-Squire Ltd.

THE DAIMLER COMPANY, LIMITED, Coventry.—An excellent example of the 2-3-ton Daimler chassis was shown on this stand. It was fitted with an all-steel end tipping body and hydraulic gear. The chassis was the standard Daimler type fitted with their sleeve valve engine and the Daimler-Lanchester worm-driven axle. The



All-steel 2-3-ton Daimler Tipping Body.

steel body renders the vehicle useful for a load of road metal. It has a measurement of 10 ft. by 6 ft. by 2 ft. The tip gear is hydraulic, and is operated by the engine, a load being deposited on the ground in 6 seconds. The whole operation can be effected from the driver's cab after he has released the tailboard and clamp. The chassis can be supplied in two lengths, viz., 11 ft. 6 in. or 13 ft. 6 in.

TILLING-STEVENS, LIMITED, Victoria Works, Maidstone.—A notable feature of the exhibition was the petrol-electric fire tender with escape shown on this stand. It was remarkable for an appliance which adds greatly to its mobility, and frequent demonstration served to impress onlookers with its effectiveness. This additional feature comprises an electric motor coupled to a rotary pump, the unit being easily detachable. It can be moved on its large road wheels to a considerable distance from the chassis, the 45-50-H.P.

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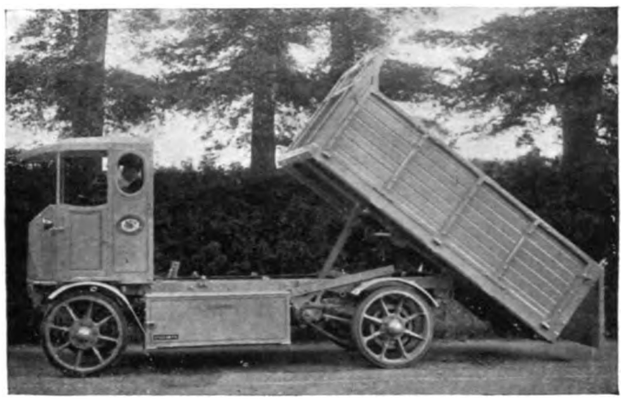
engine of which operates the dynamo, giving energy through a cable to the motor of the detachable unit. Thus the pump can be taken over soft ground or other obstacle not passable by the chassis. Permanently fixed ramps enable the pump and motor to be taken down and replaced, the replacement being by means of a wire hauling gear. There was also shown a 2½-ton chassis fitted with a hand-operated tipping wagon body.

RICHARD GARRETT AND SONS, LIMITED, Leiston Works, Suffolk, and 50, Pall Mall, S.W.1.—A 2½-3 ton patent electric vehicle represented a product for which Messrs. Garrett have made a name. Its energy is derived from an easily-accessible ironclad oxide battery, and the simple control is the Garrett patent. The wooden body tips at the end, and is electrically operated. A No. 5 superheated steam motor wagon has a mechanically-operated end-tipping body



Garrett 3½-ton Electric Wagon.

for a load of 5 tons. The tipping gear can be operated by hand and also from the engine. The superheater is a patent apparatus. The No. 4 compound steam motor tractor has 2-speed arrangement, winding drum, waterlifter, and high-duty injector. Rubber tires were fitted to the rear wheels. A 6-ton spring-mounted end-tipping trailer is specially designed for use with a fast-running motor tractor. The first and second mentioned exhibits have rubber tires to all wheels.

J. AND E. HALL, LIMITED, 10, St. Swithin's Lane, E.C.4.—Here were two typical vehicles such as are being supplied to various local authorities. A 5-ton Hallford tipping wagon built to the order of Singapore Municipality, the tip being from the end of the body by a special hydraulic fitting, and 5-ton Hallford chassis, with a four-cylinder 40-H.P. engine, fitted with a 1,000 gallon tank for street watering. The tank in the latter is interchangeable with a hand-operated tipping body, thus giving a double purpose machine very economical for municipal work or for contractors.

EAGLE ENGINEERING COMPANY, LIMITED, Warwick.—The comprehensive manner in which this company cater for the wants of the local authorities as regards vehicles for haulage and road making is shown by a bare list of their six exhibits:—(1) Warwick 5-ton patent side-tipping trailer wagon arranged to tip either side, suitable for municipal, rural, and district councils, etc.; (2) Warwick 5-ton end-tipping trailer wagon; (3) Warwick sleeping and living van with accommodation for three men, including bunks, folding table, lockers, and cupboards; (4) Warwick (Daimler chassis) end-tipping motor body on 2-3 ton chassis; (5) Water cart on two wheels – capacity 250 gallons; (6) Warwick (Daimler chassis) patent sprinkler washer, and flusher, a cylindrical tank (750 gallons) on 3½-ton chassis.

CALEDON MOTORS, LIMITED, Glasgow.—The 4-ton vehicle with tipping body hydraulically operated is remarkable for its 40-H.P. engine, each of the four cylinders (cast in pairs) being worked by a reciprocating rotary valve of the single sleeve type made under the Burt-McCullam patents. Three-point suspension is adopted for the engine. Trials have shown the new engine to give ten per cent. more power.

GENERAL VEHICLE COMPANY LIMITED, Shoe Lane, E.C.4—The merits of the G.V. battery vehicle of 3½-tons capacity are too well known to need recapitulation, but it is of interest to mention that all of the company's machines are now built in Birmingham. The iron oxide batteries give sufficient energy to traverse nearly 40 miles when a vehicle is fully loaded. A feature is the Craymer patent unloader, which enables a load to be discharged collectively or at several places. The vehicle is designed especially for refuse collection.

FODENS, LIMITED, Sandbach, Cheshire.—The latest model of the standard type 5-ton steam vehicle shown was fitted with rubber tires. The high-sided body can be further built up, and tipping can be effected either by hand or by mechanical means. Fodens are being largely ordered, the Northumbrian County Council having as many as 26 when a new order for ten has been completed.

W. AND G. DU CROS, LIMITED, Acton, W.3.—Beginning with cabs and light lorries some years ago, this firm have built up an excellent reputation for heavier vehicles for both commercial and municipal users. An example is the "W and G" 2-ton tipping wagon, which has a chassis of strong construction. Tipping to an angle of 40 deg. is accomplished by hand from either side. By fitting a body longer than is customary, the maximum rated load can be taken. The engine is 25 H.P. with four cylinders, and it is made by Dormans.

YORKSHIRE COMMERCIAL MOTOR COMPANY, Hunslet, Leeds.—The new type of Yorkshire 3-ton rubber-tired steamer was a centre of attention. This model was introduced early in 1917. Its most noticeable feature is the low loading level, which is a reduction of one foot, the platform being 3 ft. 4 in. from ground. Another innovation is that all the wheels are of the same size (830 m/m by 140 m/m), which enables the owner to maintain a stock of spare tires at less cost. The engine is of course, of the vertical compound type which has given the Yorkshire vehicle so high a reputation. The high pressure cylinder is 4 in. diameter, the low pressure cylinder 7 in. diameter, by 6½ in. stroke, and indicating 33 H.P. All working parts are in an oil tight casing, ensuring perfect lubrication. The gearing throughout is of cast steel, being machine cut to ensure silent running. Reversing gear is fitted, which forms a most effective steam brake, additional to the hand and foot brake to the rear wheels. The three-speed gear gives speeds of 4, 8, and 12 miles per hour. The tank, of mild steel plates galvanised after rivetting, is provided with manholes for cleaning. It has a capacity sufficient for 20 to 30 miles with full load. Thirty feet of suction hose is provided, enabling the tank to be filled from any stream. The boiler is of the firm's patent type, of best quality mild steel plates, with tubes of solid drawn steel, giving a safe working pressure of 200 lbs. per sq. in. The main framing of the wagon is of channel steel, 6 in. by 3 in., with strong steel cross stays. The tipping gear is Deighton's patent, engine driven, but can be operated by hand also.

SHREWSBURY S.T. AND CHALLINER TYRE COMPANY, LIMITED, Manchester, and CHAS. MACINTOSH AND COMPANY, LIMITED, Manchester.—These firms have their London office at 120, Wilton Road, S.W.1. On each company's stand the exhibits were rubber tires for light and heavy vehicles, and several patterns of wheels. Shrewsbury and Challiner produce a special crossrib tire for fire engines to prevent skidding, and specialise in converting horse-pantechnicon wheels into rubber-tired wheels, to enable such vehicles to be used as a trailer. On the Macintosh stand the N.A.P. cushion tire was shown. It is designed for light vehicles and runs on confined air, maintaining correct air pressure, and cannot burst or puncture A set of Macintosh tires exhibited had run 35,000 miles on a steam wagon in three years. Other exhibits comprised tires suitable for vehicles ranging from one ton to five tons. Considerable business is done in converting wheels of heavy vehicles to take rubber tires, thus reducing the expenditure on repairs and giving longer life to the vehicle.

NORTH BRITISH RUBBER COMPANY, LIMITED, 257-59, Oxford Street, W.1.—Attention was directed to the firm's non-skid tire for the fast moving fire engine. It is square tread, in which three deep grooves are introduced. This tire is used by the London County Council fire engines. For the company's new "W" pattern Clincher tire greater durability is claimed. The tire is for vehicles up to five tons. Steam hose, rubber matting, pedal covers, step covers, etc., were to be seen.

DUNLOP RUBBER COMPANY, LIMITED, Birmingham.—This firm has long been noted for its improvements in pneumatic and solid tires for motor vehicles. It is now engaged in testing a 300 m/m wide solid band tire designed to take the place of two 100 m/m tires on rear wheels of commercial vehicles. It is notable for resiliency, and is deeply grooved. Samples of Dunlop band tires of various sizes were shown on the stand together with worn tires showing remarkable mileage. An important departure was seen in the large magnum pneumatic and giant pneumatic tires for use on commercial vehicles up to three tons. This innovation in the U.S.A. has led to the reduction of running and repair costs. The Dunlop Company are also experimenting with rubber pads for the wheels of tractors with steel tires.

BRITISH REINFORCED CONCRETE ENGINEERING COMPANY, Manchester.—The B.R.C. fabric is used both for roadwork and for concrete structures generally. For the former it provides a surface as

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well as a foundation. An interesting war-time use was at Loch Doon camp, where the fabric was laid down on the top of bog as a forlorn hope. It succeeded perfectly in carrying a heavy motor traffic.

HADFIELDS, LIMITED, Sheffield.—It is good news for the traction and road engineer that the great steel working company is engaged at full capacity in supplying their wants. Their stand sufficed to display only a few of the machines made by them for the production of road metal, ballast, etc. A prominent object was the "Hecla" disc crusher (Symon's patent) in motion. The 24-in. size, taking pieces up to 5 in. by 4 in. by 2½ in., produces about 15 tons per hour of ¾-in. ring material for road maintenance. A notable exhibit was a compound crossing and a rail taken from the tramway track at Fitzalan Square after 12 years' service. It is made of "Era" manganese steel, and shows but little sign of wear. Other exhibits were car wheels, axles, tires, and wheel centres, besides numerous road tolls, barrow wheels, flangeless wheels for tar boilers, scarifier dicks, shovels, spades, etc.

STEAM OMNIBUSES WITHDRAWAL.

HIGH WAGES AND THE EIGHT-HOUR DAY.

The reasons that led the National Steam Car Company to withdraw their vehicles from London, and to dispose of their garages, were explained to a meeting of the London Members of Parliament on November 14 by Mr. W. J. Iden, managing director of the company, Mr. K. P. Hawksley (chairman), and Mr. C. Turner (solicitor).

A financial statement for the year ended October 31, 1918, presented by Mr. Hawksley, showed a total loss of £17,839, of which £5,393 was due to the London services. Between December, 1918, and September 30, 1919, various increases of wages were given, including the introduction of the eight-hour day. These represented an increased cost of approximately £40,000 per annum, and in addition there was an increase of 4s. per week to drivers and conductors as from October 1, representing an additional £6,250. In 1914 drivers were paid 10s. per day of 11 or 12 hours, and conductors 6s. 8d. In 1918 the figures were 15s. 1d. and 12s. 3d., still for 11 or 12 hours a day. In 1919 wages were 15s. and 13s. 4d. respectively for a day of eight hours only. During last month the approximate loss was £7,180, without charging depreciation. In September there was a similar loss of £4,079. The serious position was shown by the fact that the omnibuses were losing in October 5d. per mile, which meant about £300 a day, or £50,000 for the winter. They were going to cut their loss and operate in places in the country where remunerative traffic could be secured.

Referring to statements that the receipts of the omnibuses had been from £10 to £12 per day, Mr. Iden said the average daily earnings this year were :—

July	...	...	...	...	...	£8	18 9
August	...	...	...	...	...	8	19 0
September	...	...	...	...	...	8	15 6
October	...	...	...	...	...	7	18 7
Nov. 1 to 11	...	...	...	...	...	6	7 10

Paraffin, which in 1916 was 3¾d., had risen in July and August to 1s. 4d. per gallon. The employees were warned 12 months ago of what would happen if the expenses continued to increase.

Mr. Turner: I told their secretary, when they were seeking an increase, that the time would come when they would put the last straw on this camel, and break it down.

A Well-Designed Body by Messrs. Hora on a Thornycroft Chassis.

PINCHIN, JOHNSON AND COMPANY, LIMITED, Bevis Marks, E.C.3.—Protective, finishing, and decorative materials for tramway car and other vehicles were shown in profusion. These included Minerva paint and satinette enamel. Deydol distemper, hygeia flat wall finish, stains, varnishes, materials suitable for use by builders and decorators engaged upon public works, were also shown.

THE NEW TRANSPORT COMPANY, LIMITED, 27, Queen Victoria Street, E.C.4.—Numerous photographs were shown of the Gattie system of transport which is claimed to be the economic method of handling goods in large manufacturing and densely-populated centres. The system is based on an electro-mechanical machine which automatically controls and sorts parcels and bales of merchandise. The machine can be seen in operation at the company's works by appointment.

VISLOK, LIMITED, 3, St. Bride's House, Salisbury Square, E.C.4.—The Vislok safety lock nut is put to highly satisfactory use by vehicle manufacturers and engineers generally. A better demonstration of its need cannot be desired than is provided by the firm's possession of a number of wooden paving blocks taken at random from Westminster Bridge, in each block there being embedded one or more nuts that have fallen from vehicles. Many of the leading commercial vehicle manufacturers now standardise Vislok.

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Replying to a question whether other companies were not similarly affected, Mr. Turner said he thought they also were losing money.

Sir Harry Samuel and other members decided to ask the Minister of Transport to receive a deputation. Subsequently they received a communication from Sir E. Geddes, stating that to meet a deputation would render no good service. He added that in a case in which a company withdrew their vehicles on the ground that the traffic was not remunerative, the Ministry could not interfere.

COST OF OMNIBUS OPERATION.

Mr. J. W. Hame, general manager and electrical engineer, York Corporation Tramways and Omnibus Department, has compiled the following return of the cost of operating petrol, electric, and railless trolley omnibuses —

PETROL OMNIBUSES.

Number of onmibuses.—Birmingham, 52; Wolverhampton, 8; Sheffield, 24; York, 1.

Mileage.—Birmingham, 1,052,904; Wolverhampton, 126,076; Sheffield, 524,750; York, 7,308.

Revenue per omnibus mile.—Birmingham, 22·72d.; Wolverhampton, 18·29d.; Sheffield, 20·46d.; York, 11·59d.

Petrol per omnibus mile.—Birmingham, 5·73d.; Wolverhampton, 4·40d.; Sheffield, 5·55d.; York, 4·63d.

Traffic expenses per mile.—Birmingham, 7·38d.; Wolverhampton, 4·95d.; Sheffield, 7·09d.; York, 5·06d.

General expenses per mile.—Birmingham, ·90d.; Wolverhampton, 1·98d.; Sheffield, ·53d.; York, 3·24d.

Maintenance.—Birmingham, 4·81d.; Wolverhampton, 3·86d.; Sheffield, 4·73d.; York, 3·56d.

Total costs per omnibus mile.—Birmingham, 18·82d.: Wolverhampton, 15·19d.; Sheffield, 17·90d.; York, 16·49d. In York the expenses would have been higher if gas had not been used.

Percentage of working costs to traffic revenue.—Birmingham, 82·83; Wolverhampton, 83·05; Sheffield, 87·58; York, 141·41.

EDISON ACCUMULATOR OMNIBUSES.

Number of omnibuses.—Lancaster, 5; York, 4.

Mileage.—Lancaster, 67,791; York, 73,073.

Revenue per omnibus mile.—Lancaster, 12·60d.; York, 9·14d.

Electric power per omnibus mile.—Lancaster, 3·28d.; York, 2·90d.

Petrol per mile.—Lancaster, 2·51d.; York, —.

Traffic expenses per mile.—Lancaster, 2·61d.; York, 2·61d.

General expenses per mile.—Lancaster, ·95d.; York, 1·55d.

Maintenance.—Lancaster, 2·18d.; York, 3·31d.

Total costs per omnibus mile.—Lancaster, 9·02d.; York, 10·37d.

Percentage of working costs to traffic revenue.—Lancaster, 71·5; York, 113·46.

RAILLESS TROLLEY CARS.

Number of omnibuses.—Bradford, 17; Leeds, 8.

Mileage.—Bradford, 34,400; Leeds, 167,837.

Revenue per omnibus mile.—Bradford, 10·55d.; Leeds, 13·33d.

Electric power per omnibus mile.—Bradford, 1·50d.; Leeds, ·57d.

Traffic expenses per mile.—Bradford, 5·88d.; Leeds, 4·66d.

General expenses per mile.—Bradford, ·84d.; Leeds, ·29d.

Maintenance.—Bradford, 3·73d.; Leeds, 4·24d.

Total costs per omnibus mile.—Bradford, 77·95d.; Leeds, 9·76d.

Percentage of working costs to traffic revenue.—Bradford, 113·27; Leeds, 73·22.

BOARD OF TRADE AND CAR PRICES.

The President of the Board of Trade was asked in the House of Commons on November 25, by Mr. Percy (Tynemouth), whether he was aware that almost immediately upon the opening of the exhibition of motor cars at Olympia practically the whole of the English manufacturers raised the prices of cars in sums varying from £50 to £300; whether this action was taken by concerted arrangement among the manufacturers; whether it was justified by the attitude of labour in the car trade or otherwise; whether he was aware that the action had raised resentment on the part of intending buyers, and that large numbers of contracts for purchase had been cancelled; and whether he would cause inquiries to be made with a view of taking action to put a stop to combines, or trusts, or profiteering in cars against the public interest.

Mr. Bridgeman (Parliamentary Secretary to the Board of Trade) stated in a written reply:—I am aware that there is at present a large demand for motor cars, and that the prices charged have been at a high level. My right hon. friend will consider the advisability of taking the action suggested in the last part of the question, but there are many articles requiring investigation which are more generally used by the public than private motor cars.

MINISTER OF TRANSPORT ON MOTOR TRAFFIC PROBLEMS.

A company of over 500 attended a dinner at the Connaught Rooms, London, on November 5, at which Sir E. Geddes, the Minister of Transport, was the guest of the Society of Motor Manufacturers and Traders.

Sir Eric Geddes remarked that the last five years had advanced motor and mechanical traction on roads in the estimation of those who mattered more than any similar period in their great career. Starting in 1895 on a commercial basis, they had advanced in spite of the legislation of the country. He hoped they stood to-day upon the threshold of a new era for transportation. Since the introduction of the internal combustion engine in 1897, this country had gone ahead in mechanical transport far in advance of any other country, and we were now seeing the fruits of our labours. During the war mechanical transport came to the front as did no other part of the great mechanism of our army, and certainly we could not have won the war without it (Hear, hear.) His belief was that for long-distance motor traffic we could only effectively use the roads if they were built for the traffic. They had got to have better roads, kept clear from slow-moving traffic, without the old red flag and man in front business, and with an organisation to act as a clearing house for motor traffic. To this latter feature he attached the greatest importance, because it was necessary in order to facilitate good loads both outwards and inwards. But heaven forfend that he should suggest that the Government should do this.

GOOD THROUGH ROADS WANTED.—MEETING THE COST.

A water macadam road, 40 ft. wide, cost £4,690 a mile to surface. Tar macadam cost £7,700 a mile to surface. A super first-class asphalted road cost £18,000 a mile; and wood pavement cost £17,000 a mile, at present prices. The Ministry was now taking the first step by classifying the roads. It was extraordinary with roads, as with railways and canals, how the gauge differed. There were no through good roads—that was to say, a good road in one county ran into a bad one in the next county.

Looking ahead, and having regard to the general financial position of the country, could they hope that the Exchequer would provide for these greatly improved roads, without which the development of the motor industry could not proceed? He did not think they could. They had got to look to a levy upon the users of the roads. True, in the petrol tax the motor industry was contributing more than it got for the maintenance of the roads. That had to be looked to, and so far as his influence could be used they would get back that tax for its original purpose of road maintenance. (Hear, hear.) He believed it was sound business that the users of the improved roads should pay for them. They could not get the roads unless they were prepared to do so; the country had not the money wherewith to pay. On the other hand, if the motoring community was going to pay, as he believed they must, they were entitled to demand that all the money they did pay went to the roads, and that the roads should not be destroyed by those who did not pay. (Hear, hear.) Those who destroyed the roads which the majority required must either adapt their system of traction to the new conditions, or pay for the damage. He said, further, although he was not a socialist, that if a road for fast traffic was made which benefitted an estate, the owner of that estate ought to pay for the benefit he derived. (Hear, hear.) Those were the lines on which he proposed to ask his advisory committee to develop their considerations.

ROAD TRAINS.—THE INDUSTRY'S LEGISLATIVE HINDRANCES.

With regard to mechanical traction, he could not see it being used for the carriage of, say, coal or bricks, or road stone in large quantities from place to place. He could not see it competing with a train service which left London at 6 p.m. and delivered goods in Edinburgh the next morning, but he believed that there was a great future for road transport, both passenger and goods, over a fifty-miles radius from our great towns, which would greatly relieve railway transport.

Another need was to arrive at some way of carrying more than a three-ton load on two axles with one driver. Labour cost too much with one driver and one man behind for the three-ton load. That meant that the dirigible train of road vehicles had got to be achieved. And they had to get a cheaper fuel in order to reduce the cost. As the first Minister of Transport, he should feel that he had failed terribly if there was not removed from the path the legislative difficulties which had confronted transportation as a whole in this country during the last thirty years. If the Ministry did not continue in the spirit which actuated it to-day, it would fail. He was confident it would not fail. The Ministry had not wanted any such proof as was provided by the railway strike of what road transport could do. The proof was given during the war, in France.

Sir A. Stanley, M.P., proposed "The Chairman," to which toast Mr. Frank Lanchester replied.

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THE KING AND AUTOMOBILE ENGINEERS.

At a reception given in Kensington Town Hall to the members of the Institution of Automobile Engineers by Mr. T. Clarkson, the president, the following message was read from the King :—

> The King has received with pleasure the loyal assurances from the President, Council, and members of the Institution of Automobile Engineers, and His Majesty is fully aware of the valuable services rendered by members of the Institution during the great war, both in the field and in the factory. The King trusts that every success will attend their effort to promote the science and practice of engineering in the development of every kind of mechanical locomotion for the benefit of the country.

Mr. Clarkson, in his opening remarks, strongly emphasised the fact that their Institution was not a trade union organisation, nor a union designed to extort higher salaries and present ultimatums to employers. They were more of the nature of a guild. Their main object was to encourage the development, science, and practice of mechanical transport.

The Prospect Before the Designing Engineer.

In the absence of Sir A. Stanley, owing to a severe cold, Sir W. Joynson-Hicks, M.P., delivered an address, in which he remarked that for many years he had watched the interests of the motor industry in the House of Commons in order to see that it was not hampered by stupid laws. This Institution could do much in helping the House of Commons. It was clear that the war could never have been carried out without the automobile engineer. (Hear, hear.) If war depended therefore on the motor engineer, practically the whole of peace would be dependent upon the output of their trade In the last resort they all depended upon the designing engineer. He wanted them to realise that designs never could be stereotyped. It seemed to him that automobile engineers had the greatest possible opportunity for individuality of any profession in the whole world. They had recently got a new Ministry of Transport. He had grave doubts on certain questions regarding the position of the roads under that Ministry. However, the House had come to a decision regarding the Ministry, and it was the duty of all motorists, as it was his duty in the House of Commons, to do their best to help the Ministry and make it a great success. (Applause.) The railways were so blocked for long distance transport that over short distances they would have to be superseded by a perfect road system, and this would provide work and opportunity for the auto-engineer. They had got behind them, in front of them, and around them a form of transport which was bound to develop more than any other in this country.

Mr. H. G. Burford (vice-president), in thanking Sir W. Joynson-Hicks, urged the members to get more young men in the country to join the Institution, and make it worthy of its objects

DISTINGUISHED STRIKE SERVICE.

The announcement that the National Council of the Commercial Motor Users' Association would consider applications for its "award of merit" medal for motor transport drivers of goods or public passenger vehicles who performed services exceptional in character during the food distribution crisis, resulted in many applications being submitted. The Council has now adjudicated thereon, and has awarded the medal, diploma, and £5 in cash to the following :—

(1) Mr. H. E. Moon, in the employ of Messrs. F. W. Gilbert, Limited, Derby. On riding on a motor-cycle from Derby to London to take delivery of six lorries for milk transport, he skidded and broke his arm. He arrived at the London depot, despatched five of the lorries, and drove the sixth back to Derby all right, with the broken arm in a splint, thus preventing 800 gallons of milk from turning sour in the country. The employer spoke very highly of the man's pluck and endurance.

(2) Mr. Dixon Flint, a Ministry of Food volunteer driver, was sent by the Ministry of Food to Somers Town goods station yard, where he drove lorries with fodder for the horses. Notwithstanding he had had to be protected by police, several of his fellow drivers being attacked outside the station, and also that his lorry was tampered with, he stuck to the job throughout the emergency period. The chief operating goods manager and his engineer testified to his personal bravery.

Lancaster Seeks Advice.—After discussing a proposal to substitute electric or petrol omnibuses for their tramways, Lancaster Town Council recently decided to call in an expert to advise on the question of transport within the borough.

LONDON TRAFFIC CONGESTION.

Experiments in Remedial Measures.

Thanks to the experts in public passenger vehicle operating who are serving on the sub-committee of the Advisory Committee appointed by the Minister of Transport to deal with the congestion of London street traffic, important experiments were inaugurated in the middle of December. The sub-committee comprises eighteen members, representative of all forms of traffic, together with the Metropolitan police. So far their recommendations are in no sense startling, and the experiments suggested were carried out in various parts of the country during the war, especially during the coal shortage.

Stops at Busy Points.

The first experiment has reference to the stopping places of omnibuses and tramcars at the following places :—Parliament Square, West Strand, Piccadilly Circus, Hyde Park Corner, Tottenham Court Road, Dalston Junction, Shoreditch Church, Aldgate, Bank, Monument, Blackfriars Road and Stamford Street, Elephant and Castle, Westminster Bridge Road and York Road, Brixton Station.

Fewer Stops.

Another experiment is to be carried out by the L.C.C. Tramways and London General Omnibus Company on at least two routes, one being competitive and one non-competitive, with the object of obtaining information as to the effect of stopping only at defined spots to take up and discharge passengers. In other words, the omnibuses and tramcars will only stop at some four places within each mile. The information thus obtained will be of great value with regard to the speeding up of traffic, the relief of congestion, and the extent to which the co-operation of the public would be forthcoming.

Traffic Rules at Busy Centres.

The following rules for all classes of traffic are being enforced in the neighbourhood of the Houses of Parliament :—

All traffic proceeding to Victoria from both Parliament Street and Bridge Street will proceed via the Palace Yard side of Parliament Square and in front of St. Margaret's Church, and all traffic from Victoria to either Parliament Street or Bridge Street via the west side of Parliament Square.

This will require two new additional refuges in Parliament Square.

Cross traffic from Bridge Street to Great George Street will be obliged to follow the traffic proceeding to Victoria on the east side of Parliament Square, and join by the Canning statue the traffic going eastward from Victoria to Parliament Street.

Bank.—Omnibuses proceeding north along Princes Street will be projected further from the junction.

Monument.—All London Bridge omnibus traffic at present proceeding along King William Street and Cannon Street, and now stopping opposite the William IV. statue, will be projected to a point south of the Monument (District) Station, and all omnibuses from Gracechurch Street proceeding beyond London Bridge, will not stop in King William Street as now, but stop at a point in Gracechurch Street east of the refuge.

West Strand.—To prevent the present serious congestion in West Strand the stopping point for eastward-bound omnibuses will be transferred from the post office at the corner of Trafalgar Square (east side) to the Golden Cross Hotel; and for west and south-west-bound ommbuses from Lyon's Corner House, at the corner of Craven Street, to the Grand Hotel, east of the existing obelisk; also the north-bound omnibuses on east side of Trafalgar Square will stop opposite the George IV. statue, instead of their present position near the Havelock Statue.

Piccadilly Circus.—To reduce the congestion in Piccadilly Circus all omnibus Strand-bound traffic from Regent Street will stop at the County Fire Office on the north side of Regent Street, near the corner of Glasshouse Street, and then proceed without stopping through Piccadilly Circus across the front of the Pavilion Theatre into Haymarket, and all omnibus Whitehall-bound traffic from Regent Street will stop on the west side of the Fountain in the middle of Piccadilly Circus, then proceeding down Lower Regent Street. The return journeys will follow the same route, both sets of omnibuses stopping on the northern journey in Regent Street outside Swan and Edgar's and not in Piccadilly Circus. The existing omnibus Charing Cross-bound traffic from Piccadilly will continue to go down Lower Regent Street.

Vehicle Queues at Hyde Park Corner.

At Hyde Park Corner there will be separate queues for the three divisions of the west-bound traffic—the first for the Kensington Road traffic, the second for the Brompton Road traffic, and the third for the Sloane Street traffic.

Staggering of Hours.

The Advisory Committee are considering the possibility of relieving the pressure during peak-load hours by urging some variation in the hours of commencing and leaving work, and steps will shortly be taken to promote in business circles action to that end.

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ROAD TRANSPORT IMPETUS.

How to Increase Home Fuel Supplies.

It is urged by the Motor Legislation Committee, of 83, Pall Mall S.W., that amendments should be made to the Electricity Supply Bill, now before Parliament, with the object of increasing the production of home motor spirit and other valuable by-products.

In 1914 some 21,000,000 gallons of benzole were produced in Great Britain, principally from coke-oven works. The pressure of war requirements increased this figure to 32,000,000 gallons in 1917. Another ten million gallons were recovered from gas producing plant, making a total production of 42,000,000 gallons. This figure represents barely 15 per cent. of the probable requirements of the motor industry in the immediate future.

A ton of coal carbonised either by high or low temperature process in coke-ovens, gas retorts, or other suitable receptacles, will produce

(*a*) 12,500 cubic feet of gas.
(*b*) 2½ gallons of benzole.
(*c*) 10 cwt. coke.
(*d*) 30 lb. ammonium sulphate.
(*e*) 100 lb. tar, from which can be extracted the heavier oils and innumerable by-products of commercial value.

In the opinion of the Motor Legislation Committee the electrical industry, properly developed, can materially assist towards self dependence for a very large proportion of the motor spirit requirements of the country. New super-power stations should include the plant necessary for the production of liquid fuel and other coal by-products.

PETROL PRICES.

Committee to Investigate Profits.

It was announced on December 5 that a committee had been formed to inquire into petrol prices under the Profiteering Act, to consist of :—

Mr. P. G. L. Webb, Board of Trade.
Mr. W. H. L. Paterson, Petrol Control Board.
Mr. A. Smith, Vehicle Workers' Union.
Two representatives of the Automobile Association and of the Commercial Motor Users' Association.
Sir Wilfred Stokes, K.B.E.
Mr. Frank Chitham, director of Harrods Limited.
Baillie P. Gillespie, secretary Horse and Motormen Union.

The committee will inquire into the reasons for the difference between the landing price of petrol, 1s. 9½d. per gallon (including tax), and the retail price, 3s. 0½d. per gallon.

THE MOTOR INDUSTRY.

It is stated that British motor car makers, without canvassing for orders, have customers to the number of 200,000 awaiting delivery of private cars.

Sir Herbert Austin, chairman of the Austin Motor Company, states that under their mass production scheme his firm will in November be turning out 150 private cars, 100 commercial vehicles, and 100 tractors per week. This is not by any means the full production hoped for in the future. He estimates that the average output of an American mass production firm is 500 vehicles a week. In view of the risk of customers transferring their orders to American firms if a large number of United States cars were to appear on the market, he considers that there should be a protective tariff until British makers get into their stride.

Imports from America.

Before the Labour troubles in the United States came to a head, imports of American cars and parts in this country were received on October 16 to the value of £15,135, and on October 17 to the value of £27,838.

A London agent of an American firm had not at the end of October received any delivery on an order of 4,000 cars of a new model. Delivery had been promised in batches of 100, the whole order to be completed in January next.

German Competition Abroad.

A Copenhagen firm invited tenders from English, French, and German firms for 400 cars. Two English firms offered delivery in April, 1920, and one French firm offered delivery in March. A German firm (the Benz) obtained the contract on promising delivery in November, 1919, at a price roughly three-quarters of either the English or French quotations. This price was made possible owing to the low price of the mark.

FREIGHT EXCHANGES.

Action by the Commercial Motor Users' Association.

The Traffic Committee of the Commercial Motor Users' Association was convened for December 4, under the chairmanship of Mr. Walter Wolsey, junr., to deal with the recommendation of Sir Eric Geddes that the organisation of freight exchanges for road transport should be taken in hand by haulage interests in preference to any Government Department. A memorandum on the subject has been drawn up by Mr. E. S. Shrapnell-Smith, chairman of the National Council of the Association, and the views of the various divisional and area committees throughout the country are being asked on the following, amongst other points :—

1. Co-operation with proprietors of approved depots and garages.
2. Who will benefit by the establishment of clearing houses, freight exchanges, or goods brokerage organisations ?
3. The best method of linking existing or prospective area or divisional schemes.
4. The question of contractual liability of any intermediary between vehicle owners, and particularly liability for failure of a promised vehicle to present itself punctually.
5. The expediency (or inexpediency) of approval by the Association for any company promoting proposals, which approval has not yet been given to any promoter.
6. The causes of the comparative failure in past years of efforts to establish freight exchange organisations.
7. General rules for the conduct of freight exchanges on their equivalent in respect of a system of records.
8. The extent to which direct means of telephonic communication must be provided, inclusive of decisions as to centres between which the provision of private telephone wires is essential to success.

ROAD VEHICLE INQUIRY.

The Ministry of Transport announce the formation of a committee to consider and report to the Minister upon the question of taxation of and regulations affecting road vehicles. The committee, which held its first meeting on November 21, is constituted as follows :—Sir H. Maybury, Director-General of Roads, Ministry of Transport (chairman) ; Sir G. Beharrell, Director-General of Finance and Statistics, Ministry of Transport ; Sir P. Nash, Director-General of Traffic, Ministry of Transport ; Sir T. Berridge, representing the Royal Automobile Club ; Mr. E. S. Shrapnell-Smith, Commercial Motor Users' Association ; M. Stenson Cooke, Automobile Association and Motor Union ; Mr. F. L. D. Elliott, police authorities ; Mr. C. W. Tindall, agriculture ; Sir Harcourt Clare, local authorities ; Mr. F. Pick, London and Provincial Omnibus Owners' Association ; Mr. W. Rees Jeffreys, Motor Manufacturers' Association ; Mr. W. H. Pascoe, Board of Customs and Excise.

The terms of reference to the committee include (1) taxation and revenue ; (2) registration and licensing ; (3) design, construction, and weight ; (4) identification ; (5) speed limits ; (6) roads, in relation to (*a*) the effect of self-propelled traffic, (*b*) the question of safety of other traffic, (*c*) application of Section 20 of the Local Government (Emergency Privisions) Act, 1916. It is hoped that the report will be presented early next year.

ARMY CARS AND LORRIES.

In the House of Commons, Mr. Churchill stated that the number of motor lorries in the possession of the War Department at the date of the Armistice was 51,950. Sales of surplus lorries were carried out by the Disposal Board. The number of lorries reported to the Ministry of Munitions for disposal up to October 31 was 33,201.

At the dates of the last returns received, October 20 and 23 respectively, there were 2,858 motor cars on the strength of the British Army in France, and 795 on the strength of the Army of the Rhine. Of these, 1,723, which had been, or were about to be declared surplus to Army requirements, were awaiting disposal in France, and 65 of those on the Rhine had been earmarked for disposal.

New Omnibuses at Coventry.—Coventry Tramway Committee have now obtained delivery of seven new motor omnibuses, which have enabled several services to be augmented.

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MIDDLESEX C.C. AND OMNIBUS POWERS.

OPPOSITION TO SCHEMES OF THE LONDON COUNTY COUNCIL.

At a special meeting of the Middlesex County Council on November 14 the Highways Committee reported the London County Council had resolved to seek Parliamentary powers to operate omnibuses outside the London area and to extend their tramway system outside this area. It will be remembered that the County Council successfully opposed a Bill asking for similar powers, as regards omnibuses, when it was introduced in the last session of Parliament, and the committee have had under consideration the question of the steps to be taken in connection with the present proposals of the London County Council.

With regard to their tramway development scheme, the London County Council have decided to apply to the Government for the formation of an *ad hoc* body of experts, pending the formation of the contemplated Greater London Traffic Authority, to examine their proposals, such body to be empowered to hear evidence which local authorities desire to submit. The committee feel that the appointment of the proposed *ad hoc* authority would more or less usurp the powers of the Committee of the House of Commons, and further, that it would materially prejudice and weaken the opposition of other authorities, having regard to the fact that the bill would ultimately be submitted to Parliament more or less as a Government measure, and any opposition before the Committee would be rendered futile.

It should also be observed that the London County Council in their last bill asked for powers to apply certain provisions of their various Tramways and Improvements Acts to the other counties, thus giving them power *inter alia* to appropriate sites for sheds and to erect shelters, waiting rooms, etc., and it is presumed that similar powers will be sought with regard to their proposed omnibus and tramway schemes.

With regard to the question of the London County Council operating omnibuses in counties outside their own area, the committee's attention has been drawn to the fact that the last bill provided *inter alia* that the provisions of section 20 of the Local Government (Emergency Provisions) Act, 1916, should not apply to the omnibus service of the London County Council. This section prohibited the use of omnibuses on new routes except with the consent of the highways authorities, who may impose conditions. This provision would have enabled the London County Council to operate omnibus services in any part of the county without making any contribution towards the cost of the maintenance of the roads. The committee have not seen a copy of the proposed bill, but it is assumed that it will be in similar terms to the one which was recently withdrawn.

The London County Council propose to seek powers to construct a tramway from the Marble Arch to Cricklewood, which will involve an incursion into the county from Bridge Terrace to Cricklewood. This proposal was recommended by your Light Railways and Tramways Committee in 1907. It appears to be the general view, owing to the congested state of the passenger traffic brought about by war conditions, which shows little signs of abatement, that there is now an undoubted need for additional means of transport, and the only point for consideration is by whom the services shall be provided.

If the county interests are to be safeguarded, the proper and, indeed, the only course, appears to be to deal with the question direct, and to promote a bill to enable the County Council to own motor omnibuses and to operate omnibus services within the metropolitan police district, and to construct the proposed tramway from Bridge Terrace to Cricklewood. Unless through-running into other districts is provided for, additional omnibus services would only tend further to congest the traffic at the county boundaries, and power must, therefore, be sought to run omnibuses not only within but without the limits of the county, and for through-running arrangements to be made as regards tramways.

The committee recommended that a bill should be promoted next session to enable the County Council to own omnibuses and to run omnibus services in the county of Middlesex or within the limits of the metropolitan police area. There was also a proposal that tramways should be constructed in various parts of the county, providing through-running arrangements, coupled with a proviso that the Council should have power to lease the whole or part of either of the undertakings. It was necessary that forty members of the Council should vote for the proposal.

Colonel Pinkham, M.P., chairman of the Highways Committee, said it was a proposal to link up their own districts. When the lease to the tramway company fell in about ten years hence it would be time to consider the question of leasing or re-leasing. Forty-three members voted for the resolution, which was carried.

MOTOR VEHICLES FOR MUNICIPALITIES.

MERTON URBAN COUNCIL have ordered two electric vehicles.

NORWICH CORPORATION have purchased a petrol motor wagon.

WREXHAM RURAL COUNCIL have obtained a motor ambulance.

HETTON URBAN COUNCIL propose to acquire an electric wagon.

HINDLEY URBAN COUNCIL are placing an order for two tipping lorries.

WEDNESBURY URBAN COUNCIL have decided to obtain a steam wagon.

WIGAN COUNCIL have decided to purchase three motor tipping wagons.

PRESTON CORPORATION have agreed to purchase a Leyland lorry for £1,290.

WHITEHAVEN COUNCIL are considering a scheme for purchasing a motor fire engine.

SOUTHEND CORPORATION propose to purchase a motor fire engine at a cost of £1,490.

BRADFORD ELECTRICITY COMMITTEE have agreed to purchase two 19-cwt. delivery vans.

CAERPHILLY URBAN COUNCIL have decided to inaugurate a service of Tilling-Stevens omnibuses.

WALTHAMSTOW COUNCIL have purchased four Clayton steam wagons from the Ministry of Munitions.

GOSFORTH URBAN COUNCIL are purchasing two lorries for the collection of house refuse, at £2,520.

BATH CORPORATION have called for a report upon the collection of refuse by electric vehicles in other towns.

SOUTH SHIELDS COUNCIL have decided to obtain an electric vehicle if obtainable at an advantageous price.

BRISTOL CORPORATION have sought sanction to raising a loan of £6,600 for the purchase of six motor tipping wagons.

SHEFFIELD ELECTRICITY COMMITTEE have ordered two 5-ton steam tipping wagons from the Yorkshire Commercial Motor Company, the vehicles to have rubber tires.

WOLVERHAMPTON CORPORATION, in consequence of the high cost of horses and horse-keep, have decided to make a trial of an electric vehicle in the cleansing department.

GLASGOW CORPORATION CLEANSING COMMITTEE recommend the purchase of a steam wagon at a cost of £1,000 for use in connection with Pioneer loading and sweeping machine.

WOLVERHAMPTON CORPORATION have asked for sanction to obtaining a loan of £12,000 for the purchase of seven omnibuses with Tilling-Stevens petrol-electric chassis. They are also obtaining a chassis to be used as an ambulance for hospital patients.

GLASGOW CORPORATION recently ordered electric vehicles from Edison Accumulators, Limited, and Electric Vehicles, Limited. At the last meeting of the Corporation Cleansing Committee there were submitted communications from these companies stating that, owing to strike troubles and other causes beyond their control, they are unable to deliver any of the vehicles within the time stipulated in their contracts.

NEW LONDON GOODS SCHEME.

AN ORGANISED SERVICE OF MOTOR VEHICLES.

Under a scheme of the Railway Executive Committee, which to some extent is an alternative to the proposed Gattie "clearing house," a London area from Hammersmith on the west to the docks on the east, and from Highgate on the north to Herne Hill on the south, will be divided into nine districts for cartage purposes. All merchandise will be divided into two classes—full loads for one or two traders only, and miscellaneous merchandise requiring sorting.

Full wagon loads will be sent by rail to the depot nearest to the point of delivery, while miscellaneous merchandise will be sent to the company's main stations. There are to be 26 distributing centres, each serving its own zone, which as far as possible will have the same boundaries as the new postal districts. The zones will be sub-divided into sections, each to be served by the same carman as far as it is possible. Fast motor vehicles run on a fixed time table are to handle traffic between the main stations and the distributing centres. The scheme will operate towards keeping miscellaneous slow-moving traffic off the streets by inducing the small trader to send his consignments from one area of London to another through the railway companies' organisation, instead of using his own cart.

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MOTOR TRAFFIC

MOTOR TRAFFIC NOTES.

WALTHAMSTOW OMNIBUS PROPOSAL.—Walthamstow Council Tramways Committee have suggested that powers should be sought to run motor omnibuses.

PRICE OF A.E.C. CHASSIS.—Owing to the increase in the cost of labour and materials, the Associated Equipment Company, Limited, have been obliged to fix the selling price of their chassis at £1,175.

THE NAVY'S CARS.—The total number of motor cars in use by the navy on November 1 was 162, since reduced by 46. There are seven navy motor cars at headquarters in London and three in the Greater London area.

BY-PASS ROAD FOR CROYDON.—The Corporation of Croydon on December 1 started the construction of the by-pass road between Thornton Heath and Purley, by which through traffic will avoid the congested High Street.

OPENING FOR OMNIBUSES AT HOLYWELL.—As the districts of Newmarket and Mold have no railway or road service to Holywell, the Urban Council of the latter town have asked the Ministry of Transport to institute an omnibus service.

THE PETROL DEPARTMENT, 20, Berkeley Square, London, W.1, was closed on November 22. All further communications for that department should be addressed to Mr. P. J. L. Webb, C.B., O.B.E., Patent Office, 25, Southampton Buildings, Chancery Lane, W.C.2.

SALE OF LORRIES TO EX-SERVICE MEN.—In reply to a question put to him in the House of Commons, Sir E. Geddes said that the sale of lorries on the instalment system to demobilised men and others with small capital was a matter for the Disposal Board of the Ministry of Munitions.

OMNIBUS QUEUE AT BROAD STREET.—On November 21 the London General Omnibus Company introduced the queue system to deal with the passengers who use the services from the terminus in front of Broad Street Station. The experiment worked smoothly. Two inspectors of the company marshalled the people.

RAILLESS CARS FOR BRADFORD.—Mr. R. H. Wilkinson, general manager of Bradford Corporation Tramways, has designed a type of railless vehicle which will be larger than those now in use at Bradford. The new vehicle will seat fifty people, and will have a smoking compartment. The plans have yet to be approved by the authorities.

BRADFORD CHARS-A-BANC OWNER'S PROPOSAL.—Bradford Tramways Committee were recently asked by a chars-a-banc proprietor to allow him to run one of his vehicles on the Duckworth Lane route as the service needed supplementing. The Committee rejected the offer on the ground that it would increase the congestion of traffic.

MORE LONDON DEMAND FOR TRANSPORT.—The London County Council have accepted an estimate of £108,000, subject to the approval of the Ministry of Health, for the acquisition and laying out of 250 acres at Bellingham for housing purposes. Motor omnibuses and the Council's tramways run past the site and there are three railway stations near.

LEYLAND OMNIBUSES FOR EDINBURGH.—One of the twelve Leyland omnibuses recently ordered by the Edinburgh Corporation Tramways Committee has been delivered, and is locally described as admirably suited to its purpose. It is constructed with a door at each end, thus enabling passengers to enter or leave with a minimum of inconvenience.

PROPOSED OMNIBUS SERVICES FOR THE POTTERIES.—The special Tramways Committee of Stoke-on-Trent Council have decided to recommend the Council to abandon the proposed purchase of the undertaking of the Potteries Electric Traction Company, Limited, and to promote a bill in Parliament for power to purchase and run motor omnibuses in the six federated towns of the Potteries and the adjacent districts.

LORRIES TO RELIEVE CONGESTION.—Sir E. Geddes, Minister of Transport, has stated in the House of Commons that the Ministry had taken no steps to organise State systems of road transport, and it was thought that the provision of such services was wherever possible a matter for private enterprise. The arrangement under which Government lorries were working at certain ports and railway centres to relieve congestion was a temporary measure.

WARNING TO LONDON OMNIBUS DRIVERS.—At the South-western Police Court on November 12 Mr. Bankes heard a case in which a man was charged with assaulting an omnibus driver, who, it was alleged, refused to stop his vehicle to take up a wounded soldier. The magistrate remarked that drivers habitually refused to stop when hailed. The poorer the people the less were the drivers inclined to stop. He could not understand why the police did not take action.

CHAMBERS OF COMMERCE AND ROAD SERVICES.—Exeter Chamber of Commerce have considered the question of road transport schemes to supplement the railway which had been taken up by the Bristol and Leicester Chambers of Commerce. It was agreed that it would be of great advantage to traders to utilise motor transport between different centres, and it was decided to assist in every possible way. The difficulty at present is to obtain return loads through the want of an exchange.

STANDARDISING MOTOR CARS.—Sydney (N.S.W.) Municipal Council have decided that, in accordance with a report by the city electrical engineer with the object of standardising the motor cars used by the electric lighting department, and gaining increased efficiency and economy, the four cars at present operated be replaced by four single-seated cars of robust and highly standardised make, the cars at present in use to be sold one at a time, starting with the D.F.P., and tenders be invited for four new cars.

U.S.A. WAR TRUCKS.—It is stated that there are more than 100,000 army vehicles in the United States, and that 39,723 of these are surplus. Included among those held surplus are 819 unserviceable trucks awaiting sale at auction. Public auctions are now being held for the sale of these unserviceable trucks at the army camps and storage yards. Up to September 30 the War Department had not completed its inventory, and did not know how many trucks would be taken by the various Government bureaus, and had not arrived at any means of disposing of what may be surplus trucks.

SUGGESTED PLATEWAY FOR MOTOR VEHICLES.—In a paper on "Road Transport and Values," read before the Auctioneers and Estate Agents' Institute, Lord Montagu said it was not difficult to prove that it would pay all mechanical transport to use a specially made vehicle road, even if tolls were charged for its use. In the case of arterial roads of a width to accommodate three lines of traffic each way the outside track should, he thought, be a plateway on which all the heaviest vehicles would run with but little wear and tear to tires, steel or rubber. In fact, they might again use the steel wheel on the steel surface.

OMNIBUS POWERS ADVISED FOR LOWESTOFT.—Mr. H. H. Saunders, general manager of Lowestoft Corporation Tramways, in the course of a report on the annual conference of the Municipal Tramways Association, recommends the Council to obtain powers for running an omnibus service. The widening of the borough boundaries and the whole future development of the district, in his opinion, made it necessary that steps should be taken as quickly as possible to enable the Council to solely control the whole of the public transit within their boundary. A big seasonal traffic awaited those enterprising enough to take advantage of the opportunity.

ROAD SERVICES WANTED AT CAMBORNE.—In reply to a suggestion by Camborne Chamber of Trade, the Plymouth divisional superintendent of the Great Western Railway has promised to consider the question of instituting road motor services. The Chamber decided that the matter should not be allowed to get hung up, and that particulars of districts to be served should be forwarded to the superintendent without delay. On the question of goods services by road to supplement the railways, it was agreed to work with other Chambers to obtain such facilities, and the opinion was expressed that with an efficient organisation the difficulty of securing return loads could be overcome.

HEAVY MOTOR VEHICLES AND ROAD DAMAGE.—Gloucestershire County Council have passed the following resolution and forwarded copies to the Prime Minister, the Ministry of Transport, and the County Councils Association:—"That the County Council views with alarm the large increase in the cost of road maintenance, and having regard to the great damage caused to the roads by heavy motor vehicles, is of opinion that there should be no further delay in imposing on the owners of such vehicles a larger and more proportionate tax, to be appropriated for the purpose of road maintenance. Further, that the Government be urged to at once appoint the Joint Committee of members of the two Houses of Parliament to deal with the matter, which was promised prior to the outbreak of war."

BRIGHTON-HOVE OMNIBUS SERVICE AND THE LABOUR PROBLEM.—On the ground that the labour problem does not justify them in entering upon such a project, Hove Corporation have declined to confer with Brighton Corporation in considering the question of establishing a joint omnibus service. Messrs. Tillings, Limited, who now operate the service, have offered to lease the Corporation powers at £40 per omnibus per annum, thus giving each borough about £2,000 per annum. Brighton Corporation have since been recommended to accept the offer of Tillings, Limited, to run omnibuses for a period of seven years in return for a wayleave in the borough of about £2,000 per annum. The same rate will be paid to Hove Council. The fares will be subject to the approval of the two authorities.

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THE
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SATURDAY, DECEMBER 20, 1919.

LONDON TRAFFIC INVESTIGATION.

With a Ministry of Transport so lately established, few traffic experts could have expected that the Government would accede to the recommendation of the Commons Select Committee in favour of a Traffic Board for London, notwithstanding that the constitution of such an authority was advised by the Select Committee which reported in 1913 on accidents with power-driven vehicles and by the Royal Commission of 1905. Evidently it is intended that the work shall appertain to the Ministry. That it is intended to invoke the aid of legislation to deal with Metropolitan traffic is evident from the appointment of a technical committee " to study and report on London traffic problems, to define the new powers required, and to make recommendations thereon." It is in keeping with British public spirit that the eighteen experts forming the three sub-committees are doing the work in an honorary capacity. Their zeal indicates a desire to come to grips with a problem the solution of which is long overdue. Their representative character reflects credit upon the selections made by Sir Eric Geddes, though there is one respect in which improvement could be made. We refer to the constitution of the third sub-committee, part of whose work comprises consideration " of the adequacy of the existing facilities and the provision to be made for future traffic developments, the linking up of tramway and omnibus routes, the need of a unification of the tramways in Greater London, through running and better co-ordination of services, with a recommendation of specific means of dealing with rush hour traffic." Apart from a representative of the Great Eastern Railway, the only experts on this sub-committee are an officer of the Underground Railways and the Omnibus Company, and a member of the Highways Committee of the L.C.C. To render the sub-committee fully qualified, one or two nominations should have been made from the outer tramway undertakings. Nevertheless, the reports of the three sub-committees are likely to be of great value, and if the Ministry obtains the necessary powers to carry into effect such of the recommendations as it may approve, a great and beneficial change will be witnessed both immediately and in the future. This is apparent from the agendas of the other two sub-committees. One has to deal with street obstruction, maximum and minimum speed limits, scheduling particular streets for specific purposes, regular stopping places for all hackney carriages, and the formation of queues. The other body is examining the existing highway accommodation, the possibility of diverting particular classes of traffic from main thoroughfares to parallel streets, the construction of new roads for either omnibus or tramway traffic, and prescribing standard forms of paving and co-ordinating periodic renewals of road surfaces. Experimental work now in progress includes revision of stopping places of tramway cars and omnibuses at congested places, and the advantage of the changes made is already appreciable.

CHRISTMAS DAY SERVICES.

As mentioned last week, it has been found impossible to secure a uniform arrangement with the employees throughout the country, and what services are to be run on Christmas Day will be determined in each town. In view of the fact that the Joint Industrial Council for the tramway industry is now in existence, it is a little difficult to understand why such a matter as this cannot now be settled on some general principle. Tramways are after all run for the benefit of the public, and the employees if the matter were properly placed before them should see reason for providing a reduced service for at least a portion of the day. They would, of course, be given free time on another day to compensate them for working on a public holiday.

Attempts have been made to secure the assent of Manchester and Salford employees to run a few cars. Mr. G. W. Holford, general manager at Salford, said last week that his Committee were most anxious that some cars should run, and had forwarded the following letter to the union :—" The convenience of the public demands the running of a tramway service on Christmas Day, and the Committee regret to learn of the decision of the employees. The Committee are very desirous that the public convenience should be met if at all possible, and with that object in view are prepared to meet a deputation from the men's Association on Tuesday next to endeavour to make arrangements which will be satisfactory to all parties." A deputation of the employees was to attend meetings of the Tramways Committee in the hope that some arrangement satisfactory to both workers and employers may be arranged.

At Birmingham, Huddersfield and a number of other places, cars will not be run on Christmas Day.

Last year the employees of Burnley Corporation declined to run the cars on Christmas Day, and this year the Committee have without demur acceded to the request for a general holiday.

Newcastle Tramways Committee have requested the men to run a Sunday service on Christmas Day, or failing this, no other service. The men do not desire to give this service, but on the other hand are agreeable to carry out the week-day service, and have passed a resolution to this effect. In the discussion it was pointed out that to run a Sunday service would only entail 500 employees being engaged, fully 200 not being employed. Apparently the men are not anxious to work on Christmas Day. They think there should be a clear day's holiday, and they do not care to have some of their number at work and others on holiday.

At Leicester the employees have unanimously decided to ask the Tramways Committee to suspend the service on Christmas Day. The men's idea is that if they ran the cars for seven hours on that day the Committee would in justice have to pay them double rates, and the extent to which the cars are likely to be used on what is essentially a stay-at-home day is not likely to justify the double expenditure.

Services will probably be suspended at Southport, as the employees have sent a petition to the Tramways Committee asking for a holiday. The Committee are prepared to accede to their desire on the basis of no work no pay. Any man who wishes to work will be allowed to do so at double pay.

Electricity Supply Bill.—On Tuesday the Lord Chancellor in the House of Lords introduced amendments to the Electricity Supply Bill, which have severely restricted its scope. The district electricity boards have disappeared. The powers by which generating stations and electricity supply undertakings could be compulsorily acquired are removed, and the ownership of stations may remain as at present. The financial proposals in the Bill are greatly changed, but the Electricity Commissioners remain, and the transitory powers including a grant of £20,000,000 for the development of schemes in the interim period are retained. As Standing Committee B of the House of Commons devoted many weeks to the consideration of the Bill, the provisions of which the Government uncompromisingly upheld throughout, their action in the House of Lords will require some explanation in the Commons when that House is asked to agree to the Lords' amendments. Doubtless in some future session an amended Bill will be brought in reconstructing the scheme that has now been practically abandoned.

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LOSSES OF LONDON TRANSPORT UNDERTAKINGS.

On Thursday the Advisory Committee on London Traffic considered the financial position of the passenger-carrying undertakings, Mr. Kennedy Jones presiding. Mr. Haward, comptroller of the London County Council, stated that the deficiency on the working of the tramways was at present £137,000, and it is estimated that next year the deficit would be £580,000 owing to the great increase in working expenses, particularly in wages. Asked by the Chairman if he could see any way of relief except by an increase of revenue, Mr. Haward said that if there were less competition with motor omnibuses they would probably meet the expenses at the present fares.

Sir Albert Stanley, in giving evidence on behalf of the Underground group, said that, excluding the subsidy of £560,000 which the District Railway received as a controlled line from the Government, and an approximately reasonable sum allowed for renewals, the results from all the ten companies for the current year would show a loss of £600,000. Without making provision for fixed charges and the interest on any of the guaranteed stocks which might be outstanding, or for interest on preference and ordinary shares, the estimated loss for the year 1920 was £2,000,000. The total expenditure for 1920 over that for 1919 would be £2,050,000, a sum that would have to be raised by increased earnings. They could not go on with the present arrangements, and there was not the remotest chance of meeting the loss except by an increase of fares. The services carried 1,300,000,000 passengers in the year, and an addition of a halfpenny for each passenger journey would realise £2,500,000 yearly. In reply to the Chairman, Sir Albert said that at no period had the railways paid a fair return on the money invested.

L.C.C. TRAMWAY MATTERS.

Among the matters dealt with at the meetings of the London County Council on Tuesday and Friday were the following :—

MEETINGS OF THE COUNCIL.—The Council decided to hold their meetings fortnightly as was done during the war and until the end of May, 1919.

ADVISORY COMMITTEE AND FARES.—The General Purposes Committee had been informed by the Advisory Committee on London Traffic that they proposed to invite the Council to furnish them with a complete statement as to the present and future financial condition of the tramway undertaking, and of any considerations which rendered an increase of fares necessary. The Highways Committee thought that the comptroller and the general manager of the tramways should prepare and submit the information asked for, and should give evidence if desired. This course was agreed to.

PROPOSED INCREASE OF FARES.—The Highways Committee reported on the results obtained from the new fares during the past six months. The results show that there is likely to be a considerable deficiency on working after the payment of debt charges. They had come to the conclusion that if the financial stability was to be maintained it would be necessary to arrange for a further increase in fares. Certain adjustments in the fares which were well within the statutory fare limits would, it is anticipated, produce considerable additional revenue. Owing to increased wages and other costs, similar difficulties were being felt by other undertakings, both tramways and omnibuses, in the metropolitan area, and a revision of fares in the case of these other undertakings was under consideration. The Advisory Committee of the Ministry of Transport had asked that a decision on the subject of fares might be delayed in order to give them an opportunity to review the questions involved, and the Highways Committee had deferred submitting definite proposals until the end of January. Their action was confirmed.

TRAMWAY LEGISLATION, 1907-1919.—Particulars were submitted of the number of tramway schemes brought up to the Council, adopted by the Council, struck out by the operation of the veto of road authorities, passed by Parliament, and actually constructed since 1907. The totals for the nine years were: Put forward, 109; adopted by Council, 91; struck out by veto, 46; passed by Parliament, 28; actually constructed, 25. Of the three lines authorised, but not yet actually constructed, two are under construction, and the Committee hope to submit a recommendation shortly with regard to the third scheme.

TENDERS FOR LEE GREEN—ELTHAM TRAMWAYS.—The following tenders had been considered for (1) overhead electrical equipment for the Lee Green to Eltham tramways, etc. :—

	£	s.	d.
Clough, Smith & Co., Ltd.	8,650	2	1
British Insulated & Helsby Cables, Ltd. ..	9,838	15	6
J. G. White & Co., Ltd.	11,323	9	8

and (2) for low-tension electric cables for the Lee Green to Eltham tramways, etc. :—

	£	s.	d.
Western Electric Co., Ltd.	23,803	9	1
British Insulated & Helsby Cables, Ltd. ..	24,227	10	0
W. T. Henley's Telegraph Works, Ltd. ..	24,430	4	5
Siemens Bros. & Co., Ltd.	24,752	4	8
Johnson & Phillips, Ltd.	24,965	0	0
W. T. Glover & Co., Ltd.	25,302	3	9
The Union Cable Co., Ltd.	25,419	19	0
Callender's Cable & Construction Co., Ltd. ..	25,593	14	1

The Highways Committee's recommendation to accept the lowest tender in each case was adopted.

MAINTENANCE OF TRACKS.—The Highways Committee reported that it was proposed to hold a conference at 2.30 p.m. on January 30, at the County Hall, of representatives of the Council and the various Metropolitan borough councils in whose areas the Council works tramways, to consider questions affecting the working of the undertaking arising out of the proposal to secure an alteration of the general law so as to relieve tramway undertakings of all liability as regards the maintenance of roadways, except to the extent to which additional expenditure for maintenance devolves on the road authorities by reason of the tramway undertakings.

INSPECTION OF RAILS.—The Highways Committee were granted authority for the employment of a temporary inspector of rails for one year from December 31, 1919, at a rate of pay not exceeding £7 7s. a week.

TENDERS DURING CHRISTMAS RECESS.—The Highways Committee were authorised to open tenders involving capital expenditure over £1,000 for the supply of materials, etc., and the execution of work received during the Christmas recess.

NEW CARS.—Mr. Squires, chairman of the Highways Committee, said the question of providing new cars to meet future developments was under consideration.

PROCEEDINGS OF THE ADVISORY COMMITTEE.—Mr. J. D. Gilbert, M.P., asked the Highways Committee if any recommendation had been received from the Advisory Committee as to four stopping places per mile on certain tramway routes, and if the Committee agreed to the suggestion. Mr. Squires replied that no such recommendation had been received from the Advisory Committee. Mr. Gilbert further asked if any report had been received from the General Manager as to the effect on the tramways undertaking of the change in stopping places which came into effect the previous week—were the results advantageous or otherwise, and did the Advisory Committee ask for suggestions from the Council.—Mr. Squires said no official reports had yet been received. The changes made were experimental for a period of three months, and would be subject to revision. The tramways would benefit by any improvement in general traffic conditions, and the Highways Committee would support the Advisory Committee in any further changes which would be, on the whole, to the advantage of tramway and other traffic.

TENDERS FOR STONEWARE DUCTS AND PAVING.—At the supplementary meeting on Friday the following business was dealt with. The following tenders were received for laying stoneware ducts, repaving, etc., in connection with the construction of the new tramways from Lee Green to Eltham, and in East Hill, Wandsworth :

	£	s.	d.
G. J. Anderson, Poplar	8,346	3	4
John Mowlem & Co., Ltd., Westminster ..	8,522	2	8
G. Percy Trentham, Ltd., Birmingham ..	10,295	0	0
J. G. White & Co., Ltd., London, E.C. ..	13,879	18	0

The Highways Committee recommended the acceptance of the tender of John Mowlem & Co., Ltd. The amount of the tender exceeded the estimate of the tramways department by £1,992, and it was, moreover, stipulated that should any variation take place in current rates of labour, cost of material, transport, etc., after the submission of the tender, the price quoted would be proportionately increased.

ILLUMINATED DIRECTION SIGNS.—The Highways Committee recommended as an experiment that six illuminated signs indicating the way to the Council's tramways should be erected in suitable positions in the City of Westminster at an estimated cost of £85, with an annual cost for maintenance and lighting of £60.

DOUBLE TIME PAY FOR CHRISTMAS WORK.—Under various agreements the majority of the employees in the tramways department receive double time payment for work done on Christmas Day, and the Highways Committee now recommended that all other employees should be paid at the double time rate for Christmas Day service.

EQUIPMENT OF CARS WITH TRACTION GEAR.—In response to invitations to selected firms to tender for the equipment of fifty additional electric cars with traction gear, the following tenders were received :—

	£	s.	d.
Brush Electrical Engineering Co., Ltd. ..	£1,050	0	0
A.B.C. Couplers, Ltd.	1,493	15	0

CONFERENCE WITH LOCAL AUTHORITIES.—The following were appointed representatives of the Council at the conference to be held between the Council and the Councils of the various Metropolitan boroughs in which the Council's tramways operate, on the subject of the maintenance of tramway tracks :—Lieut. H. H. Gordon, and Messrs. G. H. Hume, J. Speakman, and Henry Ward.

The Council adjourned after the meeting on Friday until January 27.

Apprenticeship on Plymouth Tramways.—The scheme of apprenticeship suggested by the manager and engineer of the Plymouth Corporation tramways (Mr. H. P. Stokes) has been adopted by the Council. Under this scheme the boys now engaged as conductors on the cars will be taken into the workshops, and arrangements made to apprentice them to particular trades in accordance with their personal inclination and ability.

Staff of the Ministry of Transport.—In the House of Commons on December 11th, Sir Eric Geddes said that the total staff employed by the Ministry numbered 449. Of this number 55 were previously employed by railway companies, 14 by local authorities and 13 by engineering firms. Other than the Minister and Parliamentary Secretary, there were 31 officials who received a salary of £1,000 a year and upwards.

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INCREASE IN FARES.

Peterborough Electric Traction Company have given notice to the Town Council of their intention to apply to the Light Railway Commissioners for an Order authorising an increase of tramway fares from 1d. to 2d. per mile, or a portion of a mile.

Rowley Regis Council has asked the manager of the Birmingham and Midland Tramways Company to meet it in conference for the purposes of discussing fares, in regard to which there have been complaints. The recent increases are thought to bear heavily upon the passengers who travel short distances, and it is said that the fresh stages are very inconvenient.

Portsmouth Town Council on December 9 adopted the recommendation of the Tramways Committee that 1d. sections of not less than a mile in distance be formed, that the existing sections and the charge for cheap tickets, school tickets and workpeople's tickets be increased by 50 per cent., and that it be left to the chairman and vice-chairman to decide as to the date from which such increases shall take effect. The Mayor (Alderman Timpson), as chairman of the Committee, said that Portsmouth was behind every other town in the United Kingdom in the raising of fares. They had done their best, but it was not possible to go on as a commercial concern without increasing the fares.

MISCELLANEOUS NEWS AND NOTES.

Omnibuses for Walsall.—Walsall Corporation Tramways Committee propose to ask for authority to obtain additional motor omnibuses at an estimated cost of £15,000.

Glasgow Track Renewal.—Glasgow Tramways department hope to be able to renew the rails on at least ten miles of double track before the end of the financial year in May next.

Stopping Places for Omnibuses.—York Corporation tramways manager has been instructed to arrange fixed stopping places for the omnibuses.

Threepence per Omnibus Mile.—Staffordshire County Council has imposed a charge of threepence per omnibus mile for vehicles running on new routes.

Point Controllers at Plymouth.—Plymouth Tramways Committee have approved the purchase of automatic point controllers for nine places on the tramway system so as to obviate the further employment of boys.

All-Night Service of Cars for Glasgow.—In August, 1914, an all-night service of cars for Glasgow was approved by the Corporation. It was not, however, begun, but it is now proposed that the scheme should be revived and the matter is receiving the attention of the Tramways Committee.

Free Passes for the Blind.—Wolverhampton Town Council has approved the issue of free passes to blind persons, who will be allowed to travel on the cars and omnibuses on their signing an undertaking that they will use only the lower deck of the cars, and that any person accompanying them shall pay the regular fare.

Newcastle Corporation Bill.—In the Bill of the Newcastle Corporation to be submitted in the next session of Parliament, provision is made for linking up the Newcastle and the Gateshead tramways. A double line is to be constructed across the high level bridge, which at present carries the North-Eastern railway but no tramway.

Wolverhampton Corporation Bill.—Wolverhampton Town Council has approved the Bill to be promoted in the next session, empowering the Corporation to own and run motor omnibuses within and beyond the borough, to confer further powers with regard to the tramway undertaking, and for other purposes.

New Trains for the Metropolitan Railway.—The new type of electric train which has been constructed for the Metropolitan Railway was on view on Thursday at Baker Street station, where members of the public were invited to inspect it. The new train is an instalment of an order placed by the company for one hundred new cars.

Fine for Non-Payment of Fare.—A woman passenger on the Liverpool tramways was fined 20s. for wilfully evading payment of the fare. A plain clothes inspector who travelled on the car said that the conductor called "fares, please" twice and collected from several passengers, but the defendant, who had money in her hand, did not offer to pay and eventually left the car by the driver's end.

Free Travelling for Disabled Soldiers.—Kirkcaldy Town Council propose to grant the request of the local branch of the Discharged and Demobilised Sailors' and Soldiers' Federation that local ex-service men who have lost both legs should be allowed to travel free on the tramway cars, and men who have lost one leg should travel at half fares.

Swansea's Motor Omnibus Proposals.—At a meeting of the Swansea Tramways Committee, it was decided that in the event of Mr. J. B. Hamilton being requested by the Council to come to Swansea to advise them upon the question of the establishment of a motor omnibus service, he be asked to attend a meeting of the Committee to discuss his report, provided that he would do so without increasing the fee for the report.

Huddersfield Corporation Bills.—The Huddersfield Town Council have unanimously approved the promotion of two Parliamentary Bills, one to empower the Corporation to acquire the Ramsden, Huddersfield, estate, and the second to empower the Corporation to construct tramways in the district of Fixby and the borough of Brighouse; to confirm an agreement with the Brighouse Corporation; to increase fares and to authorise the running of omnibuses without the boundary of the borough; and to construct railway sidings in connection with the Corporation's gas and electricity undertakings.

Melbourne Railway Electrification.—The New South Wales Railway Commissioners report that an increase in traffic of at least 30 per cent. has followed the electrification of the St. Kilda suburban railway. In September, 1918, the passenger journeys numbered 233,335, and in September, 1919, there was an increase of 126,391, or 37.9 per cent. Normal causes are said to account for a portion of the increase, but it is estimated that no less than 30 per cent. is due solely to the improved service consequent upon electrification.

Blackpool and Fleetwood Tramroad Company.—The directors of Blackpool and Fleetwood Tramroad Company, one of the most successful tramways ever established in this country, have intimated to their shareholders that Blackpool Corporation will take over the concern on January 1, 1920. The capital of the company is £150,000, and it is proposed to distribute the money at the rate of £15 for each £10 share, and there will subsequently be a further distribution.

Damages for Accident on L.C.C. Tramways.—At Westminster County Court damages to the amount of £44 were awarded for personal injuries, including a fracture of the collar bone, received by Miss Hetty Gamble, who fell from a London County Council car. The plaintiff said she asked a woman conductor to stop the car at Stockwell Road, but before she alighted the bell was rung and the car moved on with a jerk, throwing her into the roadway. The defence was that the plaintiff got off when the car was going 7 or 8 miles an hour.

"Safety First" Propaganda.—The London "Safety First" Council have decided again to offer money prizes and diplomas to the drivers of motor omnibuses for freedom from accidents during the ensuing year. The "Safety First" scholarship of £50, and prizes and certificates for the best essays written by children attending schools in the Greater London area will also be offered. A "Safety First" publicity campaign will be organised for the last week in February. The Council's meritorious service awards have been given to three persons for saving life on the Underground railways and in the streets.

Edinburgh Tramways Arbitration.—It is five months since the Edinburgh tramways were handed over to the Corporation, but the *Edinburgh Evening Dispatch* says that a settlement between the Corporation and the Tramways Company seems to be as far off as ever. The arbitrator has held sittings in Edinburgh, and the counsel and agents have been engaged intermittently since the proceedings were initiated, but there is still no award. Our contemporary suggests that the Town Council and the Tramways Committee should inquire into the delay, as the more the proceedings are prolonged the greater will be the expense.

Women Conductors at Huddersfield.—Huddersfield Corporation dispensed with the last of its women conductors on December 9th. Each women employee who has been in the continuous service of the tramways department for a period of over two years is to be presented with a silver and enamel brooch bearing the arms of the borough, over which is the inscription, "The Great World War, H.C.T., 1914-1919." The general manager, Mr. A. A. Blackburn, stated that during the war the department had employed 211 women conductors and 45 car cleaners, of which 132 had been employed for a period of one year and 60 for more than two years.

Workmen's Fares at Newport.—At a meeting of the Newport Town Council, Alderman John Moxon said that the Electricity and Tramways Committee had received the following resolution from the Trades Council on the question of the provision of workmen's cars:—"That this Trades Council insists that the tramcars between the hours of 5 a.m. and 9 a.m. and 4.30 p.m. and 6.30 p.m. shall be run at the present workmen's rates, which shall apply to all passengers." The Tramways Committee, however, considered that it was impracticable to adopt that resolution. The figures showed that the early workmen's service of cars between 5.30 a.m. and 7.30 a.m. resulted in a daily loss of £9 4s., or for 305 working days, of £2,806. Between 7.30 a.m. and 8.30 a.m. the loss was £3,858, the total annual loss on the whole time being £6,664. From 8.30 a.m. to 9 a.m., when normal fares were charged, there was a profit for 305 days of £5,825. It was clear, therefore, that it was impossible to run workmen's cars at workmen's fares up to 8.30 a.m. or 9.30 a.m. without making a loss which could only be met by a heavy demand upon the rates.

Union of Vehicle Workers.—To celebrate the union of the Amalgamated Association of Tramway and Vehicle Workers and the London and Provincial Union of Licensed Vehicle Workers under the style of the United Vehicle Workers, meetings were held in Newcastle on December 14. The objects of the amalgamation were explained by Mr. Ben Smith and Mr. N. Bradwell, national organisers, and Mr. J. Cliff, secretary of the National Joint Tramway Council. In the evening Councillor James Smith, of Newcastle, presided over an open meeting. The chairman said there were too many unions and too few trade unionists. He had not the slightest doubt that the United Vehicle Workers would eventually become linked up with the National Union of Railwaymen. He thought they should not only use their strength industrially but nationally and locally as well. Mr. J. Cliff said the union was for road transport workers, goods as well as passengers, and they ought to organise their forces to take a definite position in the history of trade union reform as well as become a powerful organisation. The Union was affiliated with the National Transport Federation, and was thus also a part of the Triple Alliance. While they had the alliances for defensive purposes, they were for constructional purposes as well, and they had to use them for the definite objects they had in view.

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Electricity Supply to Jarrow Tramways.—South Shields Corporation have given notice to the Jarrow and District Traction Company to terminate the agreement to supply electricity to the tramways. The company proposed to obtain a supply from the County of Durham Electrical Distribution Company, but the Electricity Committee has refused to consent to this, because it is itself willing to provide a supply on what it considers reasonable terms. A sub-committee of the Electricity Committee, and the borough electrical engineer and the tramways manager are to confer with the company and endeavour to reach a settlement.

Aberdeen Suburban Tramways Current Supply.—The proposal that Aberdeen Corporation should terminate the agreement with the Aberdeen Suburban Tramways Company to supply current was discussed at a meeting of the Town Council on December 15, and it was decided to remit the report again to the Tramways Committee. Baillie Gray said it would be scarcely fair to terminate an agreement that had been in existence for so long without further notice. Under the new Act they were obliged to make an agreement; if they did not, the Ministry of Transport would make it for them, and in any case they could not exclude the company's cars from their streets. They would not suffer a great deal if the agreement continued for another year or eighteen months.

Damages Against Passenger for Ringing Bell.—At Manchester County Court on December 11th, Christina Powell claimed damages from the Manchester Corporation and Mr. Samuel Berline in respect of personal injuries that she had sustained through the joint or alternative negligence of the defendants. The evidence showed that on December 27th, 1918, Mr. Berline, a man of 75 years of age, rang the bell of a tramcar, and the car started while the plaintiff had one foot on the step. She was thrown into the road and injured. Judgment was given in favour of the Corporation, but Mr. Berline was ordered to pay £50 damages to Miss Powell as well as costs of both the plaintiff and the Corporation. Judge Mellor, accepted the driver's statement that the bell was rung twice, not once as the defendant claimed, and he could not agree that the guard was guilty of negligence. On another point submitted on behalf of Mr. Berline that it was the duty of the Corporation to have a trolley boy or someone to guard the bell against misuse, Judge Mellor remarked that if the case went to a higher court, and that point was laid down, it would affect the whole of the tramways in the country.

PERSONAL.

Captain W. C. Hawke, borough engineer and surveyor of Dover, has been elected president of the National Union of Local Government officers.

Mr. J. Brierley has been appointed traffic manager of Southampton Corporation tramways. He was formerly traffic superintendent of the Rhondda Tramways Company.

Mr. Edwin Jacob, who has resigned the position of managing director of the Tudor Accumulator Company, Ltd., retains the business of the Rail Welding Company which he acquired from the Tudor Accumulator Company some time ago. His address is 119, Victoria Street, S.W.1.

Mr. Arthur Ellis, General Manager and Engineer of the Cardiff Corporation Tramways, who is retiring from his position at the end of the year in order to take private practice, has been presented with a silver inkstand and tray by the administrative staff of the Traffic Department. Mr. Ellis, in acknowledging the gift, said that although he was leaving the service of the Corporation he would remain in Cardiff.

We regret to record the death on Friday last of **Mr. W. G. Conner,** the son of Mr. J. Conner, O.B.E., manager of the English Electric Company's works, Preston. Mr. Conner was 33 years of age. In 1914 he was in Spain on work connected with Spanish ore, but on the outbreak of war he was sent to America to obtain tools and machines for the manufacture of ammunition. After the armistice he made a business tour through America and Japan.

FINANCIAL.

Brazilian Traction Light and Power Company.—A quarterly dividend of 1½ per cent. has been declared on the preference shares.

The American Car and Foundry Company was registered at Somerset House on December 11 with a capital of £20,000 in £1 shares. The Company propose to deal in and act as agents for the purchase and sale of locomotives, carriages, wagons and rolling stock of all kinds for use on railways and tramways, or for road, field or other traffic. The registered offices of the company are at Georgian House, Bury Street, S. James', S.W.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended December 17th amounted to £78,350, an increase of £6,847 as compared with the corresponding period last year. The route mileage was 141.67 the same as a year ago. From April 1st (the commencement of the financial year) to December 17th (thirty-seven weeks and two days) the total receipts were £2,992,625, an increase of £534,535 on the corresponding period of 1918.

CONTRACTS AND ORDERS.

Macintosh Cable Company have an order from Heywood Council for the supply of e.h.t. and l.t. cables.

Walter Scott and Company's tender for tramway rails has been accepted by Manchester Corporation.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAME.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1918.	Incr. or Dec.
Aberdare U.D.C.	Dec. 9	509	585	+ 76	36	19,964	+ 1,775
Aberdeen Corporation	,, 10	2,455	2,930	+ 475	27½	91,997	+ 18,997
Ayr Corporation	,, 13	425	460	+ 35	20	22,290	+ 4,350
Belfast City	,, 12	8,986	10,197	+ 1,211	37	380,804	+ 78,682
Birkenhead Corporation	,, 14	2,202	2,931	+ 729	36½	107,518	+ 25,990
Birmingham Corporation	,, 6	24,092	26,980	+ 2,888	36	928,412	+ 77,714
do. Motor Buses	,, 6	1,368	1,705	+ 337	36	62,324	+ 8,989
Blackburn Corporation	,, 10	1,618	1,952	+ 334	37½	35,506	+ 18,145
Bradford Corporation	,, 13	9,238	11,826	+ 2,588	37	422,773	+ 79,540
Burnley Corporation	,, 13	2,368	2,960	+ 592	..	..	..
Burton-on-Trent Cor.	,, 14	430	500	+ 70	37	16,615	+ 3,448
Bury Corporation	,, 14	1,918	2,048	+ 130	36½	37,358	+ 11,748
Chatham & District	,, 4	1,176	1,323	+ 147	48	72,870	+ 10,396
Cork Electric	,, 4	544	688	+ 144	48	33,903	+ 4,120
Derby Corporation	,, 13	1,499	1,894	+ 395	37	71,783	+ 16,073
Dundee City	,, 10	1,921	2,394	+ 473	29½	76,470	+ 18,680
East Ham Corporation	,, 13	1,643	1,870	+ 227	35½	71,216	+ 13,899
Edinburgh	,, 6	8,831	9,816	+ 985	22½	252,091	+ 45,251
Glasgow Corporation	,, 13	28,666	32,012	+ 3,346	28	903,246	+ 102,136
Glossop (U.E. Sup. Co.)	,, 13	196	212	+ 16	50	11,149	+ 2,151
Huddersfield Corporation	,, 13	3,605	4,713	+ 1,108	37	180,754	+ 29,877
Ilford U.D. Council	,, 13	1,017	1,111	+ 94	36½	44,084	+ 7,256
Ipswich Corporation	,, 13	675	779	+ 104	37	34,625	+ 6,444
Isle of Thanet	,, 10	301	456	+ 155	10½	5,547	+ 2,452
Kilmarnock Corporation	,, 13	279	274	— 5	33½	8,662	+ 732
Lanarkshire	,, 4	3,229	3,784	+ 455	48	178,725	+ 4,909
Leeds City	,, 13	13,874	15,892	+ 2,018	37	612,300	+ 117,031
Leicester Corporation	,, 13	5,031	6,052	+ 1,021	..	..	..
Leyton U.D. Council	,, 11	2,461	2,759	+ 298	37	114,605	+ 28,777
Liverpool Corporation	,, 13	20,217	24,806	+ 4,589	49½	1,115,222	+ 264,436
London County Council	,, 17	71,503	78,350	+ 6,847	37½	2,992,625	+ 534,535
Maidstone Corporation	,, 11	261	320	+ 59	36½	14,313	+ 3,896
Manchester Corporation	,, 6	26,272	29,792	+ 3,520	36	1,594,447	+ 162,588
Newcastle-on-Tyne Cor.	,, 6	8,801	9,105	+ 304	35	340,971	+ 16,338
Northampton Cor.	,, 12	942	1,222	+ 280	37	46,748	+ 14,803
Nottingham Corporation	,, 11	5,555	6,933	+ 1,378	37	263,551	+ 52,224
Oldham Corporation	,, 14	3,506	4,325	+ 819	36	168,213	+ 36,189
Reading Corporation	,, 11	1,262	1,559	+ 297	37½	58,282	+ 1,541
Rotherham Corporation	,, 3	2,341	2,029	— 312	35½	74,574	— 2,443
Sheffield Corporation	,, 14	13,031	16,465	+ 3,434	37½	616,959	+ 111,710
Southampton Cor.	,, 10	2,433	2,919	+ 486	36½	98,969	+ 5,303
,, Motor Buses	,, 10	..	152	..	19	2,524	..
Southend-on-Sea Cor.	Nov. 26	1,033	1,338	+ 305	35	78,224	+ 30,308
South Shields Cor.	Dec. 6	1,081	1,377	+ 296	36	51,496	+ 10,016
St. Helens Corporation	,, 9	..	1,519	..	10	15,736	..
Sunderland Corporation	,, 14	2,283	2,664	+ 381	37	106,239	+ 26,663
Tyneside Trys. & Trmrds.	Nov. 26	828	997	+ 169	22	26,744	+ 4,267
Wallasey Corporation	Dec. 13	1,930	2,155	+ 525	36½	93,800	+ 24,448
Walsall Corporation	,, 13	1,265	1,583	+ 318	37	54,747	+ 2,200
Walthamstow U.D. Coun.	,, 13	1,387	1,552	+ 165	37	53,644	+ 10,222
Warrington Corporation	Nov 20	786	897	111	34	29,911	+ 4,280
West Ham Corporation	Dec. 11	4,819	5,205	+ 386	36½	196,936	+ 30,120
Wolverhampton	,, 17	1,756	2,321	+ 565	37	76,262	+ 12,493

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Wks.	Aggregate. 1918-19	Increase or Dec.
Anglo-Argentine	Dec. 9	£63,629	68,920	49	£2,906,150	+ £159,650
Ballarat and Bendigo (4 wks)	Oct. 12	3,691	4,176	28	23,563	+ 41
Brazilian Traction (Mrs.)	Oct.	8,052,000	9,980,003	43	93,539,000	+ 7,757,000
Brisbane	Sept.	35,400	41,970	39	346,370	+ 20,516
British Columbia $	Oct.	580,354	710,405	17	2,704,611	+ 590,474
Buenos Aires Lacroze	Nov	42,952	50,635	21	237,705	+ 28,941
Burmah Tram. & Light Rs.	Oct.	34,848	51,898	13	138,733	+ 31,194
Calcutta Rs.	Nov 29	86,469	94,402	47½	..	+ 542,049
Carthagena and Herrerias	Nov.	2,988	2,549	44	29,518	— 14,396
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	Nov.	1,942	2,766	17	11,156	+ 3,251
Hong Kong $	Oct. 25	14,215	14,103	43	631,551	+ 36,432
Kalgoorlie	July	2,798	2,815	30	18,657	— 126
La Plata	Nov.	5,334	6,240	45	61,479	+ 6,653
Lima	Sept	42,838	48,780	39	429,615	+ 39,887
Lisbon Escu	Mar.	238,290	276,625	..	..	..
Madras (2 weeks) Rs.	Oct. 31	39,598	46,552	42	838,454	+ 40,968
Manila $	Sept.	204,500	223,048	39	1,833,199	+ 181,918
Montevideo	Sept.	29,611	35,552	47	404,501	+ 57,428
Pernambuco	Dec. 14	5,178	7,950	49½	274,167	+ 54,657
Para	Oct.	22,442	27,940	47	273,861	+ 9,371
Peruvian $	July	987,300	1,038,780	..	..	..
Rangoon	Nov.	6,611	7,379	48	73,530	+ 7,726
Shanghai (2 weeks) $	Apr 23	50,760	56,755	16	447,279	+ 53,577
Singapore $	Nov. 8	15,034	17,312	45	697,287	+ 71,191
Toronto $	Oct.	1,018,478	1,123,891	48	10,442,253	— 202,316
Winnipeg $	Oct.	295,005	428,339	42	3,375,399	+ 406,257

CARS, MOTORS, CONTROLLERS.

(DICK, KERR SYSTEM.)

THE ENGLISH ELECTRIC COMPANY LIMITED,

Queen's House, Kingsway, LONDON, W.C.2.

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THE
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SATURDAY, DECEMBER 27, 1919.

THE OUTLOOK

If the coming year brings no better cheer to those responsible for the administration and management of tramway undertakings than the past twelve months, their lot will not be enviable. However stern may be the trials ahead, there are circumstances that should bring encouragement to those who direct transport enterprises. When it is remembered that for over four years the wealth of not only this country but of more than half a dozen others has been blown away in the form of munitions, and that millions of the producers have been either killed or incapacitated, no surprise can be felt that fourteen months of peace have not brought a settling down of industry to the task of reconstruction. Efforts in that direction have been rendered nugatory by great strikes; the effects of one of them is even now seriously hampering all forms of transport. Peaceful methods gained two increases of wages for road transport employees, following the heavy outlay occasioned by the grant of the eight-hours day. Unfortunately the owners of public passenger vehicles have not been able to recoup themselves for the extra outlay. Steps have yet to be taken to secure that recompense, and the prospect of doing so should be improved if industry generally, as now seems probable, remains at peace. Another hopeful indication is that in one town the tramway employees have shown a regard for logic—we might even say rectitude—in their treatment of the Christmas Day holiday question. It was at Leicester that the employees stated that if they ran the cars for seven hours the Corporation would have to pay them double rates, while the extent to which the cars are likely to be used was not likely to justify the double expenditure. That admission should encourage employers who are inclined to embark upon the somewhat neglected task of frankly discussing difficulties with their workpeople. If it is impossible to secure a diminution of charges for labour now that it is the avowed object of several unions to secure the conversion of war bonuses into wages, frank discussion may serve the purpose of inducing employees to give their best service, an ideal which the modern conception of a trade union seems to have killed. Some slight relief will be gained in the coming year by the absence of payments of allowances to dependants of men who have been demobilised, but the extra charges for materials and labour will far outweigh that item. Evidence of this is found in the announcements that the London Traffic Group, and the London County Council, among others must make additions to fares, and that at Glasgow, Mr. Dalrymple has advised an increase of a halfpenny to each fare. Sheffield has taken the wise step of fixing the minimum fare at twopence, and in view of the financial position of the tramways, and the high wages now being paid to all classes of workers in that great industrial centre, it is impossible to dispute the justice of that step.

INSTITUTE OF TRANSPORT.

The Rt. Hon. Sir Eric Geddes, G.C.B., G.B.E., M.P., Minister of Transport, having accepted the office of President of the Institute and a Council having been formed of personages prominent in traffic and transportation circles, applications for membership will now be entertained.

The necessary forms can be obtained from Mr. H. E. Blain, Hon. Secretary (pro tem.), at the temporary offices of the Institute, 2 and 3, The Sanctuary, Westminster, London, S.W.1.

ELECTRICITY SUPPLY BILL.

In the House of Commons on Monday the amendments in the Electricity Supply Bill approved by the House of Lords were agreed to. Mr. Shortt said that there was a considerable portion of the work under the Bill which ought to be done as quickly as possible and which could be done under the provisions that had been retained. A considerable proportion which could not be undertaken until preliminary work was done was contained in the part of the Bill that had been suspended. The Government had no intention whatever of losing it they could help it any single provision. When the suspended portion came up again in another place the Government were determined that, if any provision should be deleted, they would ask the House of Commons to reinstate it. The new Bill would consist of those portions of the present Bill as it left the House of Commons which were taken out in the House of Lords. It would simply bring back the Bill in its old form with the old powers. The only reason why they had dropped provisions out of the Bill was because the House of Lords had not had time to discuss them. Sir Eric Geddes said that they were really losing no time by going ahead with the present portion of the Bill. If, as they believed, the House would reaffirm its former decision early next session, the Government would then get the additional powers from the House of Lords.

DUTY OF DRIVERS COMING ON TRAMWAY TRACK.

At Leeds County Court on December 10, Judge Parfitt gave a decision in favour of the Leeds Corporation in a case brought by Mr. J. W. Walker, who claimed £100 damages arising, he alleged, from negligent driving of one of the Corporation's cars in Wellington Street on June 7 last. Plaintiff said that the defendants' driver was negligent in two ways; (1) at the moment of collision he was driving at an excessive speed, and (2) that he allowed his car to run into the plaintiff's cart at the back in practically broad daylight. It was alleged that soon after he had passed the stop in the street quite near to the steps leading to the Great Northern station, plaintiff pulled out on to the tramway tracks to pass a standing van, and got his horse and cart straight on the track, when the car came along without warning or care at an excessive speed and was driven into the rear of his cart, causing his knee to be jammed between the cart and the standing van. In cross-examination the plaintiff admitted that before turning out neither he nor his nephew, who was riding in the cart with him, looked behind to see if the track was reasonably clear, nor did either of them put out their arms. The plaintiff, however, said it was no part of his duty to do so.

In giving judgment His Honour said that in his opinion this view was quite erroneous. If the plaintiff was going to pass something, as in this case, which might become a source of risk to traffic immediately behind, it was clearly his duty to give reasonable notice to such traffic either by holding out his arm or in some other way, and further, if just before turning on to the rails he looked behind him and saw an on-coming car so close that it would be imminently dangerous to turn out, then in his Honour's opinion it was his duty to postpone turning out until the tramcar had passed him.

He had come to the conclusion that the defendants were not driving at an excessive speed. The defendants' car stopped at the steps, and this fact was conclusively proved by six witnesses. Bearing this in mind, after viewing the *locus in quo* and considering the defence, he had come to the conclusion that this accident was entirely and conclusively due to the plaintiff's negligence in giving the tramcar driver no chance to stop in time to avoid the collision. The driver was in his opinion in no way to blame. Judgment was given for the defendants with costs.

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CHRISTMAS DAY SERVICES.

A deputation of the Manchester employees discussed the question of a Christmas Day service with the Manchester Corporation Tramways Committee on December 16, when Mr. Davies, the branch secretary, said that the men had unanimously decided not to work on Christmas Day, and should any driver, guard or trolley boy work a car on that day the employees as a body would refuse to work with them on Boxing Day. Alderman Bowes, chairman of the Tramways Committee, said he regretted the men's decision, and they could only let it be made known that the entire responsibility rested with the men and not with the Committee.

The question of running cars in Birmingham on Christmas Day was considered by the Tramways Committee last week. During the past two years the services on Christmas Day were suspended owing to the special circumstances of war conditions, and this year the Committee desired to revert to pre-war arrangements, and to run a restricted service on practically all the routes. The proposal was to provide a service of cars from 9.30 a.m. until 1 p.m., and again from 6 p.m. until 10 p.m., in order to enable the citizens to visit their friends. The secretary of the tramwaymen's union wrote, however, intimating that the employees had decided not to work on Christmas Day, and the Council having no alternative, decided to suspend the services. Undoubtedly, as one of the Committee remarked, "the men are the masters in this matter."

At Sheffield no cars were run on Christmas Day, but on Boxing Day and the Bank Holiday Saturday the pre-Christmas extended service was given. Before Christmas Day the traffic was very heavy and every available car was called into use so that the Corporation had in service no less than 320 cars. The motor omnibus service was also increased.

The Sheriff of Newcastle (Mr. Richard Mayne) presided at a meeting of the Tramways Committee on December 18, when the question of Christmas Day services was discussed. Although arrangements had been made for running a Sunday service with a view to giving the employees as much time off as possible on Christmas Day, the Committee were prepared to run what was known as a week-day service if the men desired. A deputation of the employees who waited on the Committee were consequently asked to arrange for a ballot of the men as to whether they would run a Sunday or a week-day service. The vote resulted in a large majority in favour of discontinuing the service. Gateshead and District Tramways Company and the Northern General Transport Company also decided to run no services on Christmas Day.

The scheme adopted last year by Mr. C. W. Mallins, general manager of the Liverpool Corporation tramways, for a partial service on Christmas Day, was so satisfactory to everyone that the arrangement was repeated this year. The men agreed to work in three shifts of five hours each and to receive double pay; the men who are not required to work will receive a day's pay. The shifts were so arranged as to allow every man to be at his home some time during the day.

The companies composing the London Traffic group, including the London General Omnibus Company, decided to provide a Christmas service as on Sunday. The London United, the Metropolitan Electric and the South Metropolitan tramways arranged to run the ordinary Saturday service on Christmas Eve and the Sunday service on Christmas morning, the last cars leaving the terminal points about 2.30 p.m.

Sunderland District Tramways Company suspended their service on Christmas Day. The four district councils through whose areas the lines run, expressed the view that the men should have a holiday. It was decided to run a restricted service on the Sunderland Corporation tramways on Christmas Day and to pay the men employed double time.

At Bradford the men refused to provide any services; the Isle of Thanet Tramways Company, among others, suspended service after 6 p.m. on Christmas Day.

L.C.C. TRAMWAY MATTERS.

ESTIMATES FOR ELECTRIFICATION OF HORSE TRAMWAYS APPROVED.

At the meeting of the London County Council on Friday, December 29, a long debate took place on the recommendation of the Highways Committee to electrify on the overhead wire system the horse tramways from East India Dock Road, Poplar, to Mare Street, Hackney, for which the Stepney Borough Council recently gave consent. Finally the standing orders were suspended and this permitted the estimates amounting to £161,400 to be approved. The total cost of the line is expected to amount to £272,000. In 1915 the estimate of the total cost was £110,000.

On the recommendation of the General Purposes Committee, the Council's chief engineer and the general manager of the tramways department were appointed to attend on behalf of the Council a meeting of the National Joint Industrial Council held on December 22.

Glasgow Tramway Extensions.—Important extensions of Glasgow tramways both within and beyond the boundary of the city are indicated in a report recently submitted by the general manager, Mr. James Dalrymple, to the Finance Sub-Committee of the Tramways Committee. The total mileage of the extensions would be about 11½ miles, and the cost about £400,000. Various other extensions to outlying points that have been suggested from time to time would aggregate an additional length of 13½ miles of track at a cost of £540,000. These estimates include no allowance for the erection of bridges over the Clyde at certain points.

INCREASE IN FARES.

Owing to the loss in the working of the Hull Corporation tramways in consequence of higher wages and war bonuses, it has been decided as from January 12 to fix all fares for any distance on each main route at 1½d. The fare on the Old Town route will be raised from ½d. to 1d. The estimated deficit for the year ending March 31 next was reported to the Committee on December 18 as £11,892.

On Monday, the increased fares sanctioned by Sheffield City Council came into operation. The basis of the increase, as reported in an earlier issue, is that single fares on all routes are increased from 1½d. to 2d., except in the case of the Intake and Handsworth route, where the increase is from 2d. to 2½d., and the Petre Street route, which will be increased from 1d. to 1½d.

ROADS ADVISORY COMMITTEE.

Sir Eric Geddes has informed Mr. Alfred Short that he has received the nominations for the Roads Advisory Committee, which he has now appointed as follows:—

Mr. F. Dent (County Councils Associations); Sir Kenneth J. Mackenzie, Bt. (Association of County Councils in Scotland); Mr. J. A. Brodie, M.Inst., C.E., M.I.Mech.E. (Association of Municipal Corporations); Major W. H. Prescott, M.P. (Urban District Councils Association); Mr. P. J. O'Neill, J.P. (Irish County Councils General Council); the Hon. Sir Arthur Stanley, G.B.E., C.B. (Royal Automobile Club); Sir William Joynson-Hicks, Bt., M.P. (Automobile Association and Motor Union); Mr. D. P. Maclagan, (Royal Scottish Automobile Club); Mr. E. White (Royal Irish Automobile Club); Colone F. S. W. Cornwallis, D.L. (Royal Agricultural Society) and Mr. Will Thorne, M.P.

MISCELLANEOUS NEWS AND NOTES.

New Cars for East Ham. East Ham Borough Council have ordered four double deck cars, at a cost including equipment of about £2,100 each.

Funerals on Tramway Tracks.—Swansea Corporation Tramways Committee have asked the chief constable to take steps to ensure that funerals are diverted from the tramway tracks.

All-Night Cars at Glasgow.—The general manager of the Corporation tramways has been asked to prepare a report on the running of all-night services, which were about to be put into operation when war broke out.

Municipalisation of Greenock Tramways.—A deputation from Greenock Corporation, headed by Provost Mitchell, attended a meeting of the Port Glasgow Town Council on December 17, when a discussion took place regarding the municipalisation of the tramways. No decision, however, was reached.

Free Travelling for the Blind.—Bury Tramways Committee have granted a request of the local branch of the National League of the Blind to allow blind persons to travel to workshops at Bolton on the cars free, on the understanding that the Committee accept no responsibility for injury to such persons when travelling on the cars.

Tramway Shelters.—Bradford Tramways Committee are being urged to provide shelters for passengers waiting for cars in the centre of the city. The *Bradford Daily Telegraph* suggests that Forster Square is an ideal centre for the experiment, and advises the Tramways Committee to visit Manchester and look at the shelters of the verandah type which run down the centre of some of the main tramway routes.

Sanction to an Extension at South Shields.—The Light Railway Commissioners, as the result of their inquiry, have granted the application for extension of the South Shields Corporation Tramways as far as it relates to the construction of one mile four furlongs and seven chains of light railway from the tramway in the borough to the southernmost corner of the Corporation's Cleadon Park estate. The cost of the scheme will thus be reduced by £30,000.

Oldham and Ashton Arbitration.—The arbitration between the local authorities of Ashton, Hyde, Denton and Audenshaw and the Oldham, Ashton and Hyde Tramway Company on the taking over of the company's tramways by the local authority, will be held in London in January. As the local authorities have combined in the purchase from the company, the proceedings will be considerably curtailed.

The London Electrical Industrial Council.—At a conference held on Monday at Caxton Hall, Westminster, it was decided to form a district council for the Greater London area under the National Joint Industrial Council for the Electrical Industry. Representatives of the electricity supply companies, the municipal undertakings, and the different trade unions were present, and Mr. C. P. Sparks presided. Separate meetings will be held to elect representatives of the employers and workers respectively.

Lancaster and District Tramways.—A Sub-Committee of the Lancaster Corporation is reconsidering the whole question of the proposed agreement between the Lancaster and District Tramway Company and the Morecambe Corporation for the purchase of the company's lines in Morecambe Road, and the subsequent repair of the road. Morecambe Corporation is to be invited to appoint a Sub-Committee to confer with the representatives of Lancaster Corporation.

Insufficient Power at Belfast.—Recently there have been some stoppages of the Belfast tramway service, lasting in one case about fifteen minutes, owing to deficiency of electric power, which is supplied from the Corporation lighting station. It was officially explained that the electricity station is at present producing the maximum output, and between the hours of 4.30 and 6 p.m., when the shipyards, other manufactories and business premises consume extra current for lighting purposes, the power available for tramways has not been sufficient.

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London Motor Cab Dispute Settled.—A dispute affecting the engineers, mechanics and smiths in the shops of the British Motor Cab Company was settled on December 19 the management agreeing that payment should not be based on results, an arrangement to which the men objected.

Tramcar Without Lights.—A case of a very unusual kind came before the Wigan County Bench on December 19, when the motorman of a St. Helens tramcar was summoned for driving without lights. It was stated that the trolley of the car came off, and instead of applying the brakes the driver allowed it to run down an incline to the terminus without any lights. The defendant, who said he was not aware that the trolley was off, was ordered to pay the costs.

Office Hours and the Peak Load. Among the suggestions of the London Traffic Advisory Committee for the improvement of services in London is one that all Government offices should adopt the hours from 9 to 4, instead of 10 to 5, as at present. It is recognised that the change would not be practicable in all business offices, The Committee, however, err in giving the closing time as 5 o'clock. A small minority may leave at that time; the majority depart at 5.30 and 6 o'clock.

Omnibuses at Reading.—Reading is now linked up by a motor omnibus service with Caversham Heights and Tilehurst. The route is via Bath Road and passes the tramway terminus in Oxford Road, thus linking up with the Reading tramways. The *Reading Mercury* remarks that this is merely a beginning, and it will soon become evident that it is totally inadequate. Many more omnibuses are necessary, and other neighbourhoods will have to be served, and our contemporary thinks that the sooner the Tramways Committee set about supplying their demands the better.

Taxation of Motor Omnibuses.—In the House of Commons on Monday, Sir Eric Geddes, in reply to a question by Mr. Roper, who asked whether the Minister of Transport would consider the possibility of introducing legislation to provide for the payment of a fair mileage rate by the owners of private omnibuses to the highway authorities, replied that a departmental committee was considering the question of the taxation of mechanically-propelled road vehicles, with a view to raising revenue to meet the increased cost to the highway authorities.

Glasgow and the Industrial Tramway Council.—Glasgow Corporation has refused to be represented on the National Industrial Council for the tramway industry. As a consequence, a circular has been forwarded by Mr. A. G. Gee, secretary of the district committee of the United Vehicle Workers (Glasgow branches) to Glasgow members of Parliament and to the members of the Town Council, stating that under no consideration are the Corporation tramway workers going to make a local settlement on wages, hours and general conditions of labour which is not in conformity with national settlements.

Deputy Director-General of Roads.—Mr. Neal, Parliamentary Secretary to the Ministry of Transport, replying to Lieut.-Col. Archer-Shee in the House of Commons on December 18, said: "The position of Deputy to the Director-General of Roads has been offered to the chief roads engineer of the Hertfordshire County Council, who was lent by the Council to the Road Board during the war. So soon as the appointment as Deputy is completed, he will vacate his position under the County Council. He has at no time been drawing any salary from the Road Board or the Ministry of Transport.

Electrical Workers in the London Area.—The Industrial Court has awarded an advance of 5s. per week to workers in the electricity undertakings in London and the suburban districts, including those of the London County Council, who claimed 15s. a week. The award stated that the men concerned have already received war advances up to 28s. 6d. a week, and in addition those of 21 years of age and over have been granted a bonus on earnings of 12½ per cent. in the case of time workers, and 7½ per cent. for piece workers. In a similar claim made for the electrical workers on railways in the London district, the Court awarded an increase of 5s. per week.

London Traffic Experiments.—Modifications in the stopping places of motor omnibuses and tramway cars in London, recently fixed by the Advisory Committee on London Traffic, have been announced. All the arrangements are experimental and the effects are being carefully watched. It has been recommended that notices worded as follows: "London Traffic Committee—Slow moving traffic keep near the kerb," should be displayed experimentally on certain routes. On two roads where fixed stopping places for omnibuses have been arranged, there are about six stopping places per mile, four of which are compulsory and two optional. The police, tramway authorities, and omnibus companies will be asked to submit early reports on the results of the new regulations.

London County Council's Financial Commitments.—The Finance Committee of the London County Council in their annual report on future capital expenditure say that the Council appears to be faced with an amount of expenditure during the next seven years out of all proportion to anything which the Council had hitherto undertaken. The magnitude of the prospective expenditure rendered it imperative that the Council should restrict the amount within such limits as might be dictated by financial conditions. The first place in the order of importance of projected works should be given to the scheme of food relief works, and the Council's housing scheme. Education should be of the next importance and the schemes for tramways and street improvements appeared to follow these.

FINANCIAL.

This Week's Issue.—Owing to the Christmas holidays, the current issue was printed on Tuesday, December 23. Consequently only a few traffic returns for last week are included in the usual list of returns published on page 380. In the Stock Exchange quotations of Tramway and Omnibus Shares, the current prices given are those of December 22, and for comparison the prices of a year ago as well as those of July 27, 1914, are included.

Provincial Tramways Company.—The report for the year ended September 30 shows that the net revenue received from the local companies was £35,644. The directors recommend a dividend of 10d. per share on the ordinary shares and a bonus of 6d. per share, making with the interim dividend 10 per cent. for the year.

National Steam Car Company.—For the year ended October 31 last the figures show a profit of £24,481 1s. 7d., after making provision for the maintenance of the omnibuses in operation, depreciation of plant, etc. A sum of £2,596 0s. 6d. is brought forward from the previous year, giving a total of £7,077 2s. 1d., out of which the directors recommend a dividend at the rate of 10 per cent. per annum less income tax. This will absorb £25,750, leaving a balance of £1,327 2s. 1d. to be carried forward. The directors report with regret that they have found it necessary to withdraw the omnibuses from the London streets in consequence of the unremunerative results which have developed during the past year. They are however, maintaining and extending the provincial services.

Huddersfield Corporation Tramways show a better result for the year ended March 31 last than for the preceding year, the gross profit being £2,973 more. The contribution to the rates was reduced to £6,750, and the carry forward was increased by £300. Traffic receipts per car mile have increased to 19.25 per cent., but owing to increased costs of wages and materials the ratio of expenses has increased to 71.42 per cent. A summarised comparison of the accounts for the past four years is appended: —

	1919.	1918.	1917.	1916.
	£	£	£	£
INCOME:—				
Traffic revenue ..	196,747	171,197	149,499	139,980
Sundry receipts ..	2,664	3,194	3,037	3,230
Total income	199,411	174,391	152,536	143,210
EXPENDITURE:				
Traffic expenses ..	58,116	48,939	38,947	35,495
General expenses ..	9,077	8,522	7,965	8,196
Repairs and maintenance	50,977	41,940	29,220	23,913
Power expenses ..	22,344	18,189	14,717	12,377
	140,514	117,590	90,849	79,981
War allowances ..	3,060	3,937	4,957	4,451
	143,574	121,527	95,806	84,432
Balance to net revenue	55,837	52,864	56,730	58,778
Bank interest	1,056	1,061	964	139
	56,893	53,925	57,694	58,917
Interest	11,171	11,386	13,064	13,764
Income tax on profits ..	11,674	8,613	7,332	3,789
Sinking fund	11,818	11,733	12,724	12,606
Renewals fund ..	15,180	15,037	15,368	19,752
Contribution to rates ..	6,750	8,800	8,600	8,400
Parliamentary expenses	-	406	406	406
Added to carry forward	300	*2,050	200	200
Mileage of track	56	56	56	56
Passengers carried	30,946,700	32,380,732	29,069,129	26,941,412
Fare per passenger ..	1·52d.	1·27d.	1·23d.	1·24d.
Mileage	2,496,051	2,822,606	2,868,172	2,841,442
Units per car mile	1·94	2·00	2·02	1·96
Power cost per car mile ..	2·18d.	1·57d.	1·25d.	1·06d.
Traffic receipts per car mile	19·25d.	14·75d.	12·68d.	12·02d.
Expenses per car mile ..	13·69d.	10·14d.	7·71d.	6·84d.
Traffic rev. per mile of single track	£3,510	£3,057	£2,670	£2,500
Ratio of expenses ..	71.42%	67.41%	60.77%	57.13%
Number of cars in stock ..	106	106	106	106

* From last year.

CONTRACTS AND ORDERS.

East Barnet Valley Council has decided to provide the surveyor with a motor car at a cost of about £300.

Southend Town Council has accepted a tender for the supply of tramway points and crossings from Edgar Allen and Company, Ltd., at £540.

Preston Town Council have agreed that six single deck tramcars be purchased from the Sheffield Corporation for £350 each, and that the cars be repaired, painted, etc., at an estimated cost of £100 each; and that the tender of Messrs. John Cartmell & Sons, Ltd., for the supply and fixing of wooden doors to the tramway car shed for £83 be accepted.

Electrics for Ilford.—At the Works Committee of the Ilford U.D.C. the Surveyor presented a report and submitted tenders received from Messrs. Ransome's, Sims and Jeffries, Ltd., and the Edison Accumulators, Ltd., for the supply of electrically-driven motor vehicles for use in connection with the collection and disposal of house refuse. The Committee recommends that the tender of Messrs. Ransome's, Sims & Jeffries, Ltd., for the supply of six Orwell electric motors at an inclusive sum of £1,325 for each vehicle (including tipping gear and extras) be accepted.

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PRICE LIST OF TRAMWAY AND OMNIBUS SHARES.

Dividends Prev.	Dividends Last.	NAME.	Paid.	Price, July 27, 1914.	Cash Dec. 22 or previous.	A Year ago
5 %	5%	Alabama Traction 5% 1st Mt. ..	—	67	56	68¼
2/9	2/9	Anglo-Argentine 5½% 1st Pref.	5	4¾	7s/1½	80/-
2/9	2/9	Do. 5½% Cum. 2nd Pref. ..	5	4¾	60/-	74/4½
4%	4%	Do. 4% Deb.	100	91	63	72
4½%	4½%	Do. 4½% Deb.	100	98½	67¼	72
5%	5%	Do. 5% Deb.	100	96	61	74¼
—	—	Associated Omnibus Co., Ord. ..	5/-	⅜	1/2	1/2
1/-	6d.	Auckland Elec. Trams. Ord. ..	1	1 3/32	18/3	22/-
5%	5%	Do. 5% 1st Mt. Deb. ..	100	102¾	95/-	89½
7%	7%	Barcelona Trac. 7% Pr. Lien ..	100	—	99¾	107½
—	1/-	Bath Electric Trams Pref. Ord.	1	¼	3/9	3/5
6d.	6d.	Do. 5% Cum. Pref. ..	1	3/16	11/9	10/3½
4½%	4½%	Do. 4½% 1st. Mort. Deb. ..	100	72¾	65¾	68
4½%	4½%	Birmingham Dist. Pwr. and Tract. Co. 4½% 1st Deb. ..	100	84½	72½	73½
18/-*	14/-*	Bombay Elec. Sup. & Tram Ord.	10	14	81	23
6/-	6/-	Do. 6% Cum. Pref. ..	10	11⅛	13⅛	10½
4½%	4½%	Do. 4½% Deb.	100	96	77	76½
5%	5%	Do. 5% 2nd Mt. Deb. ..	100	100	87	89
$1	$1	Brazilian Trac. & Power Ord. ..	$100	66	60	55½
$1½	$1½	Do. 6% Cum. Pref. ..	$100	97	89¼	93½
4/-	4/-	Brisbane Elec. Trams. Ord. ..	5	7½	93/-	5½
2/6	2/6	Do. 5% Cum. Pref. ..	5	5	76/3	82/6
4½%	4½%	Do. 4½% 1st Deb. ..	100	101½	94½	92½
8%	8%	Brit. Col. Elec. Ry. Def. Ord. ..	100	107	55½	46½
5%	5%	Do. Pref. Ord.	100	106	53½	52½
5%	5%	Do. 5% Cum. Pref. ..	100	103	62½	67
4½%	4½%	Do. 4½% 1st Mt. Debs. ..	40	99½	82½	82½
4½%	4½%	Do. 4½% Perp. Con. Deb.	100	96½	61½	62½
£3*	6%	Brit. Elec. Traction Ord. ..	100	—	36½	47
6%	6%	Do. 6% Cum. Part. Pref.	100	—	68½	78½
5%	5%	Do. 5% Deb.	100	92	82¼	84½
4½%	4½%	Do. 4½% 2nd Deb. ..	100	77½	65	67
5%	5%	B. A. Lacroze 5% Mt. Deb. ..	100	100	84½	75½
6/-	3/6	Calcutta Tramways Ord. ..	5	7½	7½	7½
2/6	2/6	Do. 5% Cum. Pref. ..	5	5½	72/9½	82/6
4½%	4½%	Do. 4½% 1st Deb. ..	100	99½	71	72
1/-*	1/-*	Cape Elec. Tramways	1	1½	13/6	14/9
1/3	1/3	City of Buenos Ayres Trams ..	5	5½	75/-	83/1½
4%	4%	Do. 4% Deb.	100	97½	70	71½
5%	5%	Colombo Elec. Tram. & Ltg. Co. 5% 1st Mort. Deb.	100	96	77	80
5%	5%	Co. F.C. do. Jardin Botanico 5% 1st Mort. Bds.	100	93½	82½	81¾
6%	6%	Costa Rica Elec. Lt. & Trac. Co. 5% 1st Deb.	—	63½	48	57½
6/-	7/-	Dublin United Trams. Ord. ..	10	8	7¾	8½
6%	6%	Do. 6% Pref.	100	—	105	10½
—	—	Hastings & Dis. Elec. Tram Ord.	10/-	⅛	1/10½	1/6½
1/2½*	1/2½*	Do. 6% Cum. Pref. ..	1	3/16	10/9	10/9
4½%	4½%	Do. 4½% Deb.	100	67½	59½	52½
10d.	9d.	Hong Kong Tramway	5/-	⅛	26/3	23/3
5%	5%	Do. 5% Deb.	100	87½	—	98½
2/6	3/-	Isle of Thanet 5% Pref. ..	5	2½	40/-	22/9
4%	4%	Do. 4% Deb.	100	73½	51	46½
—	3%	Kalgoorlie Trams 5% A. Deb. ..	100	15	16	7 4½
—	—	La Plata Trams. Ord.	1	¼	2/-	3/-
11/-	7/-	Lanarkshire Trams Co. ..	10	10½	12½	10½
5%	5%	Lancs. Un't Trams 5% Pr. Ln.	100	85½	76½	69
5%	5%	Lisbon Elec. Trams 5% Mt. Debs.	100	95	67½	71
7½d.*	10½d.*	Llandudno & Colwyn B. Ord. ..	1	—	14/2½	9/6
—	1½d.	London & Sub. Traction Ord. ..	1	1/32	1/6	3/6
6d.	6d.	Do. 5% Pref.	1	1/16	4/-	8/3
4½%	4½%	Do. 4½% 1 Mt. Deb. ..	100	75½	55	60
4½%	4½%	L.G.O.Co. 4½% 1st Deb. ..	100	100	78½	83
5%	5%	Do. 5% Inc. Deb.	100	88½	75	77½
41/7½	41/7½	Lon. Unt. Trams. 4% 1st Mt. Db.	100	55	42	41½
2/-	3/-	Madras Elec. 6% Pref. ..	5	5½	79/-	83/9
5%	5%	Do. 5% Deb.	100	100	86½	84½
7½d.*	9½d.*	Manaos Trams & Ltg. Ord. ..	1	3/32	3/10½	5/7½
5%	5%	Do. 5% 1st Deb.	100	77	65	67½
$1½	$1½	Manila Elec. R. R. & Light ..	$100	102	75½	86½
4½%	4½%	Met. Elec. Trams. 4½% Deb. ..	100	85½	65	70
5%	5%	Do. 5% Deb.	100	87	73½	78
$1½	$1½	Mexico Trams. Common ..	$100	70	30	43
5%	5%	Do. 1 Mt. 5% G.B. ..	—	84	44	67½
—	—	Do. 6% Mt. Bds.	100	76	28½	56
4½%	4½%	Montreal Trys. Co. 4½% Stg. Dbs.	100	100	97½	94
4½%	4½%	Do. 4½% Stg. Debs. (1922)	100	99	97	91½
2/-	1/2½*	National Steam Car	1	1/32	18/3	16/9
9½d.*	9½d.*	New General Traction	1	⅛	8/3	7/3
1/1½	6d.	Northern Gen. Trans. Ord. ..	1	1/32	20/7½	13/6
4/-	3/-	Para Elec. Rlys. Ord.	5	4½	81/10½	5/4½
5%	5%	Do. 5% 1st Deb.	100	89½	70½	78
—	—	Pernambuco Tram. & Power Ord	1	—	6/4½	8/3
8½d.	8½d.	Do. 7% Non. Cm. Part Pf.	1	—	12/6	16/3
8½d.*	1/-	Potteries Elec. Trac. Ord. ..	1	1/32	14/6	8/6
6d.	6d.	Do. 5% Pref.	1	1/16	13/6	11/3
1/4	6d.	Provincial Trams. Ord.	1	⅛	18/9	19/1½
2/-	2/-	Rangoon Tram. 6% Cum. Pref.	5	5½	80/-	85/-
5%	5%	Rhondda Trams. 5% 1 M. Deb.	100	88	82½	77½
5%	5%	Rio de Janeiro Try. & Pr. 1st Mt. 30 yr. 5% Gld. Bd. '35 ..	—	97½	89½	91½
5%	5%	Do. 1st Mt. 5% 50 yr. ..	100	89½	74	83
5%	5%	Sao Paulo Deb. 5% 1st Mt. ..	$500	99	91	90½
5%	5%	Do. 5% Perp. Deb.	100	99½	71	80½
20/-	12/-	Shanghai Elec. Cons.	10	13	18½	14½
3d.	8d.	Singapore Elec. Trams. ..	5/-	¼	2/10½	5/-
4%	4%	Sou. Met. Elec. Tram & Ltg. 4% Db	100	66	56½	51
5%	5%	S. Elec. Trams. of B.A. 5% Mt. ..	—	100½	99½	97½
4½%	4½%	Toronto 1st Mt. 4½% Bds. ..	100	98	91½	94½
4½%	4½%	Tramways (M.E.T.) Omnibus 4½% Debs.	100	91	75½	75
2/-	2/-	Un'd. El. Tr. Monte Video Ord.	5	4½	40/3½	52/6
4½%	4½%	Winnipeg El. 4½% Deb. ..	100	94½	60	70½
—	—	Yorks (W.R.) Elec. Trams. Ord	5	⅛	25/6	24/-
3/-	3/-	Do. 6% Cum. Pref.	5	⅛	76/3	81/3
4½%	4½%	Do. 4½% 1st Deb	100	85½	68½	73
—	—	Metropolitan Dist. Ord.	100	21⅛	20½	26½
—	—	Undgd. Elec. Rys. of London ..	10	2⅛	43/9	69/4½
		Do. "A"	1/-	⅛	6/3	8/10½
4½%	4½%	Do. 4½% Bds. of 1933 Rd.	—	99	101½	104½
6%	6%	Do. 6% 1st. Cum. In. Db.	100	114	91	101½
%	4%	Do. 6% In. Bonds Rd. ..	—	88	85	91

Indicates dividend for the year. In other cases the dividend is for the half-year.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1918.	Incr. or Dec.
Aberdare U.D.C. ..	Dec. 9	509	585	+ 76	36	19,964	+ 1,775
Aberdeen Corporation ..	,, 17	2,506	2,950	+ 444	28½	94,947	+ 19,442
Ayr Corporation	,, 13	425	460	+ 35	20	22,299	+ 4,350
Belfast City	,, 19	9,203	10,663	+ 1,460	38	391 471	+ 80,142
Birkenhead Corporation ..	,, 14	2,202	2,931	+ 729	36½	107,518	+ 25,990
Birmingham Corporation ..	,, 6	24,092	26,980	+ 2,888	36	928,412	+ 77,714
do. Motor Buses ..	,, 6	1,368	1,705	+ 337	36	62,324	+ 8,989
Blackburn Corporation ..	,, 17	1,670	2,031	+ 361	38½	37,933	+ 18,523
Bradford Corporation ..	,, 13	9,258	11,856	+ 2,588	37	422,773	+ 79,540
Burnley Corporation ..	,, 20	2,401	2,896	+ 495	..	..	..
Burton-on-Trent Cor. ..	,, 14	430	500	+ 70	37	18,615	+ 3,448
Bury Corporation	,, 21	1,916	2,055	+ 139	37½	89,913	+ 11,887
Chatham & District ..	,, 11	1,237	1,372	+ 135	49	74,048	+ 10,531
Cork Electric	,, 11	562	748	+ 183	49	34,651	+ 4,306
Derby Corporation	,, 13	1,499	1,894	+ 395	37	71,783	+ 16,073
Dundee City	,, 17	1,995	2,449	+ 453	30½	78,920	+ 19,134
East Ham Corporation ..	,, 20	1,677	1,890	+ 213	36½	73,105	+ 14,111
Edinburgh	,, 13	8,891	9,723	+ 829	23½	261,814	+ 46,079
Glasgow Corporation ..	,, 13	28,666	32,012	+ 3,346	28	903,246	+ 102,136
Glossop (U.E. Sup. Co.) ..	,, 13	196	212	+ 16	50	11,149	+ 2,151
Huddersfield Corporation ..	,, 13	3,605	4,713	+ 1,108	37	180,754	+ 39,877
Ilford U.D. Council ..	,, 13	1,017	1,111	+ 94	35	44,064	+ 7,256
Ipswich Corporation ..	,, 13	675	779	+ 104	37	34,625	+ 6,444
Isle of Thanet ..	,, 17	318	449	+ 131	11½	5,997	+ 2,583
Kilmarnock Corporation ..	,, 13	279	274	— 5	30½	8,662	+ 732
Lanarkshire	,, 11	3,609	3 762	+ 153	49	182,487	+ 5,062
Leeds City	,, 13	13,874	15,892	+ 2,018	37	612,300	+ 117,051
Leicester Corporation ..	,, 20	5,060	6,211	+ 1,153	..	..	..
Leyton U.D Council ..	,, 11	2,461	2,759	+ 298	37	114,605	+ 28,777
Liverpool Corporation ..	,, 13	20,217	24,806	+ 4,589	49½	1,115,222	+ 264,436
London County Council ..	,, 17	71,503	78,350	+ 6,947	37½	2,992,615	+ 534,535
Maidstone Corporation ..	,, 18	293	347	+ 54	37½	14,650	+ 3,961
Manchester Corporation ..	,, 6	26,272	29,732	+ 3,460	36	1,094,447	+ 162,588
Newcastle-on-Tyne Cor. ..	,, 6	8,801	9,105	+ 304	35	340,971	+ 16,338
Northampton Cor.	,, 12	942	1,222	+ 280	37	46,748	+ 14,803
Nottingham Corporation ..	,, 18	5,782	7,110	+ 1,328	38	270,662	+ 53,553
Oldham Corporation	,, 14	3,506	4,325	+ 819	36	168,213	+ 36,189
Reading Corporation ..	,, 18	1,320	1,688	+ 368	37½	52,971	+ 1,909
Rotherham Corporation ..	,, 17	2,265	1,992	— 273	37½	78,624	— 2,927
Sheffield Corporation	,, 14	13,031	16,435	+ 3,434	37½	616,959	+ 111,710
Southampton Cor.	,, 17	2,489	3,049	+ 560	37½	102,018	+ 5,863
,, Motor Buses ..	,, 17	..	188	..	29	2,693	..
Southend-on-Sea Cor. ..	Nov. 26	1,033	1,338	+ 305	35	78 224	+ 30,308
South Shields Cor. ..	Dec. 6	1,031	1,377	+ 296	36	51,496	+ 10,016
St. Helens Corporation ..	,, 9	..	1,519	..	10	15,736	..
Sunderland Corporation ..	,, 21	2,416	2,763	+ 347	38	109,003	+ 27,010
Tyneside Trys. & Trmds ..	,, 3	881	982	+ 101	23	27,726	+ 4,368
Wallasey Corporation ..	Dec. 13	1,630	2,155	+ 525	36½	93,900	+ 24,448
Walsall Corporation ..	,, 13	1,265	1,581	+ 316	37	54,747	+ 9,200
Walthamstow U.D. Coun ..	,, 13	1,387	1,552	+ 165	37	61,644	+ 10,222
Warrington Corporation ..	Nov 20	786	897	+ 111	34	29,911	+ 4,280
West Ham Corporation ..	Dec. 11	4,819	5,205	+ 386	36½	196,936	+ 30,120
Wolverhampton	,, 17	1,756	2,321	+ 565	37	76,262	+ 12,493

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Wks.	Aggregate. 1918-19	Increase or Dec.
Anglo-Argentine ..	Dec. 16	£59,041	71,541	50	£2,977,691	+ £172,110
Ballarat and Bendigo (4 wks)	Oct. 12	3,691	4,176	28	23,563	+ 41
Brazilian Traction (Mirs.)	Oct.	8,052,000	9,280,003	43	93,539,000	+ 7,757,000
Brisbane	Sept.	35,400	41,970	39	346,370	+ 20,516
British Columbia .. .. $	Oct.	580,354	710,405	17	2,704,811	+ 590,474
Buenos Aires Lacroze ..	Nov	42,952	50,635	21	237,705	+ 28,941
Burmah Tram. & Light Rs.	Oct.	34,848	51,898	13	138,733	+ 21,194
Calcutta .. .. Rs.	Dec 6	82,745	97,187	48½	..	+ 557,085
Carthagena and Herrerias	Nov.	2,988	2,549	44	29,518	— 14,396
Cordoba	Feb.	12,972	13,549	48	159,208	+ 11,492
East India	Nov.	1,942	2,709	17	11,156	+ 3,551
Hong Kong .. .. $	Nov 8	13,850	13,735	45	659,991	+ 36,931
Kalgoorlie	Aug	3,240	2,876	34	21,533	— 590
La Plata	Nov.	5,324	6,240	45	63,479	+ 6,653
Lima	Sept	42,838	48,780	39	429,635	+ 39,887
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) .. Rs.	Oct. 31	39,598	46,552	42	838.454	+ 40,968
Manila .. .. $	Sept.	204,200	223,048	39	1,833,199	+ 181,918
Montevideo	Sept.	29,611	35,552	47	404,501	+ 57,428
Pernambuco	Dec. 14	5,178	7,950	49½	274,167	+ 54,657
Para	Oct.	22,442	27,849	47	273,861	+ 9,871
Peruvian .. .. $	July	987,300	1,058,730	..	..	..
Rangoon	Nov.	6,611	7,379	48	73,530	+ 7,726
Shanghai (2 weeks) $	Apr 23	50,760	56,755	16	447,279	+ 53,577
Singapore .. .. $	Nov. 8	15,034	17,312	45	697,287	+ 71,191
Toronto .. .. $	Oct.	1,048,478	1,123,801	48	10,442,253	— 202,316
Winnipeg .. .. $	Oct.	295,005	428,339	42	3,375,399	+ 406 257

CARS, MOTORS, CONTROLLERS.
(DICK, KERR SYSTEM.)
THE
ENGLISH ELECTRIC COMPANY LIMITED,
Queen's House, Kingsway,
LONDON, W.C.2.

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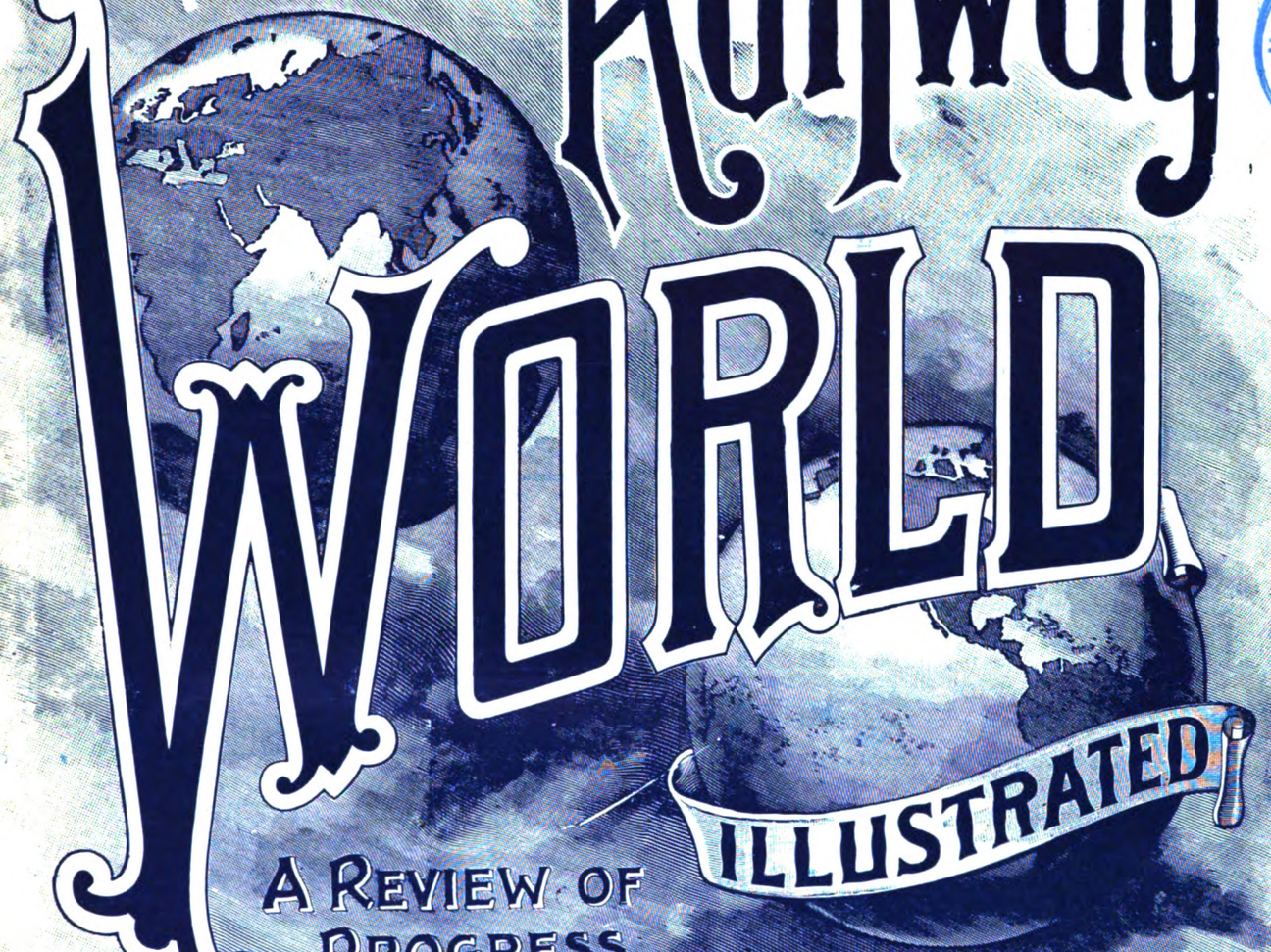
THE TRAMWAY & RAILWAY WORLD
(REGISTERED AS A NEWSPAPER.)
Established in 1892.
PRICE ONE SHILLING.

JULY 5, 1919.
Vol. XLVI, No. 1.
Offices: AMBERLEY HOUSE, NORFOLK STREET
LONDON, W.C.2
Telegrams: "TRAMIGRO, ESTRAND LONDON."
Telephone No. GERRARD 2948

The Tramway and Railway WORLD



ILLUSTRATED

A REVIEW OF PROGRESS IN Electric AND OTHER Traction.

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London Office—WINCHESTER HOUSE, OLD BROAD STREET, E.C.

TRADE S MARK

MAKERS OF

WROUGHT-IRON AND STEEL TUBES

By the LAPWELDED, BUTTWELDED, SOLID DRAWN, AND LOCK-BAR PROCESSES.

TRADE L&L MARK.

TUBULAR TRAMWAY POLES

WITH ALL THE NECESSARY FITTINGS.

TUBES AND FITTINGS FOR ELECTRIC WIRING. STEEL PLATES FOR BOILERS, BRIDGES, Etc. STEEL CASTINGS.

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NOTICES.

All Communications and Advertisements for next week's issue should be received not later than noon on Friday.

Advertisements for the next issue, of which proof is desired should reach us by the second post on Wednesday.

The Editorial and Publishing Offices of "The Tramway and Railway World" are at Amberley House, Norfolk Street, London, W.C.2.

Telegrams: "TRAMIGRO, ESTRAND, LONDON."
Telephone: GERRARD 2948.

TENDERS INVITED.

BOROUGH OF GRAVESEND ELECTRICITY DEPARTMENT.

The Gravesend Corporation are prepared to receive Tenders for Plant to the following Specifications:—

SECTION A.—One 2,000 KW. Steam Turbine with 6,000/6,600 volt, three-phase alternator, to be delivered and erected on purchasers' foundations.

SECTION B.—Condensers with motor-driven air and circulating Water Pumps, to be delivered and erected on purchasers' foundations.

Copies of the Specifications, Conditions and Forms of Tender can be obtained from the undersigned on payment of a deposit of One Guinea, which will be returned provided a *bona-fide* tender has been received and not withdrawn. Duplicate copies of the Specification can be obtained on payment of 5s. each, which will not be returned.

Tenders, sealed and endorsed "Tender for Electricity Works Extensions," must be addressed to the Town Clerk, Municipal Offices, Woodville Terrace, Gravesend, and delivered on or before Saturday, July 12.

C. F. McINNES, M.I.E.E.,
Borough Electrical Engineer.

Electricity Works, Gravesend.
July 18, 1919.

LONDON COUNTY COUNCIL.

The Council invites tenders for the supply and delivery of:
2,000 tons of Steel Conductor Tees.

Persons desiring to submit tenders may on and after Monday, July 7, obtain the drawings, specification, bills of quantities, form of tender and other particulars, on application to the Chief Engineer of the Council, County Hall, Spring Gardens, S.W., upon payment to the Cashier of the Council of the sum of £2. This amount will only be returned if a bona fide tender is submitted. Full particulars may be obtained at the County Hall previously to the payment of this fee.

No tender received after 1 p.m. on Tuesday, July 22, 1919, will be considered.

The Council does not bind itself to accept any tender.

JAMES BIRD,
Clerk of the London County Council.

BOROUGH OF BEDFORD.

Electricity Department.

Tenders are invited from Manufacturers for the Supply, Delivery and Erection of the following Plant:—

Contract No. 1.—1-1,500 K.W. Single Phase Turbo Alternator and Condensing Plant.
Contract No. 2. Water Tube Boilers, Superheaters, Mechanical Stokers and Induced Draught Plant.
Contract No. 3.—Extra High Tension Switch Gear.
Contract No. 4.—Water Softener, Feed Water Heater and Storage Tanks.
Contract No. 5.—Water Measuring Apparatus.
Contract No. 6.—Feed Pumps.

Specifications and full particulars may be obtained from the undersigned on receipt of a deposit of £1 in respect of each Contract. Deposits will be returned on receipt of bona-fide Tenders.

Sealed Tenders, endorsed "Contract No. ——," addressed to the Chairman of the Electricity Committee, Electricity Works, Cauldwell Road, Bedford, are to be delivered before noon on Monday, 14th July, 1919.

The Corporation does not bind itself to accept the lowest or any Tender.

(Signed) R. W. L. PHILLIPS,
Borough Electrical Engineer

Electric Tramcar Handbook
FOR
MOTORMEN, INSPECTORS,
AND DEPOT WORKERS.
By W. A. AGNEW.
120 Pages, 7 ins. by 4½ ins. Cloth. Price, *2s. 0d.* Postage, *2d.*
Copies can be obtained from THE TRAMWAY AND RAILWAY WORLD Offices, Amberley House, Norfolk Street, W.C.

TENDERS INVITED.

SALFORD CORPORATION TRAMWAYS.

Tenders invited by July 28th, 1919, for 12 months' supply of Male Employees' Uniform.—Apply, The General Manager, 32, Blackfriars Street, Salford.

L. C. EVANS,
Town Clerk.

SALFORD CORPORATION TRAMWAYS.

Tenders invited by July 21st, 1919, for the supply of:—
(*a*) 2,000 Tiebars.
(*b*) 500 tons Steel Rails.
Apply General Manager, 32, Blackfriars Street, Salford.

L. C. EVANS,
Town Clerk.

SAND DRYING APPARATUS.

Manufacturers of Sand Drying Apparatus are invited to submit full particulars and prices of their specialities to the General Manager, Corporation Tramways, 55, Piccadilly, Manchester.

POSITIONS VACANT.

ENGINEER FOR TRACK RECONSTRUCTION.

Wanted immediately in the Midlands, Engineer for Tramway Track Reconstruction; previous experience in supervising such work essential.—Apply, stating salary required, age, and all other necessary particulars to Box 59, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

ASSISTANT PERMANENT WAY ENGINEER.

Assistant Permanent Way Engineer required.—Apply, stating age and qualifications, MANAGER, Thermit, Limited, 675, Commercial Road, E.14.

POSITIONS WANTED.

TRAMWAY ENGINEER.

Tramway Engineer, as similar, or Assistant to Manager, etc. Nineteen years' experience; costs; records; stores; overhead cables; rolling stock; used to control of men and women.—Box 60, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

J. W. COURTENAY, Ltd.
TRAMWAY AND OMNIBUS ADVERTISING CONTRACTORS
Sole Contractors for

Liverpool Corporation Tramways
Edinburgh & District Tramways Company, Ltd.
Belfast City Tramways
Leeds City Tramways
Birmingham Corporation Tramways
Leicester Corporation Tramways
Nottingham Corporation Tramways
Portsdown & Horndean Light Railway Co.
Wakefield & District Light Railway
Londonderry Tramways Company
Calcutta Tramways Company, Ltd.
Cawnpore Electric Tramways
Delhi Electric Tramways
Mandalay Electric Tramways
Dover Corporation Tramways
Newcastle-on-Tyne Corporation Tramways
Cork Electric Tramways and Lighting Co., Ltd.
Isle of Thanet Electric Tramways Company, Ltd.
Keighley Corporation Tramways
Keighley Corporation Motor 'Buses
Burton-on-Trent Corporation Tramways
Scarborough Electric Tramways Co., Ltd.
Aberdeen Suburban Tramways Co.
Paisley & District Tramways Co.
Hastings & District Electric Tramways Co., Ltd.
Gosport and Fareham Tramways Co.
Doncaster Corporation Tramways
Cardiff Corporation Tramways
Plymouth Tramways
Gloucester Corporation Light Railways
Ilkeston Corporation Tramways
Stockport Corporation Tramways
Ilford Council Tramways
Aberdeen Corporation Tramways
Bradford Corporation Tramways
Southampton Corporation Tramways
Halifax Corporation Tramways
Perth Corporation Tramways
Malta Tramways Company
Coventry Corporation Tramways
Exeter Corporation Tramways.

Head Office:—
AMBERLEY HOUSE, NORFOLK STREET, LONDON, W.C.2.
Telephone: City 7630.
Branch Offices
EDINBURGH—34, St. Andrew's Square.
LIVERPOOL—Princes Buildings, 81, Dale Street.
BIRMINGHAM—147, Corporation Street.
LEEDS—Standard Assurance Buildings, City Square.
NEWCASTLE-ON-TYNE—50, Grey Street.

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Telegraphic Addresses and Telephone Numbers

Of Advertisers whose Announcements appear in the Illustrated Issues of THE TRAMWAY AND RAILWAY WORLD.

Name of Company or Firm.	Address	Telegraphic Address.	Telephone No.
Aerograph Co., Ltd.	43, Holborn Viaduct, London, E.C.1	Aerography, London	Holborn, 2041.
Albion Motor Car Co., Ltd.	Scotstoun, Glasgow	Automobile, Glasgow	Scotstoun, West'n. 1991
Allen & Co., Ltd., Edgar	Imperial Steel Works, Tinsley, Sheffield	Allen, Sheffield	Sheffield, 917, 265.
Allen & Co., Ltd., Edgar (Tramway Dept.)	Imperial Steel Works, Tinsley, Sheffield	Askham, Sheffield, (Tramway and Machinery)	Sheffield, 213.
Allen & Simmonds, Ltd.	Reading, Berks.	Pistons, Reading	Reading, 565.
Alloy Welding Processes, Ltd.	149, Leadenhall Street, London, E.C.3	—	Avenue, 5733.
Anger Manufacturing & Supply Co., Ltd.	Bank Chambers, Preston	Brakjuster, Preston	Preston, 1033
Armstrong, Stevens & Son, Ltd.	Whittall Street, Birmingham	Armstrongs, Birmingham	Birmingham, 6148.
Associated Equipment Co.	Blackhorse Lane, Walthamstow E. 17	Vangastow, Waltstreet, London	Walthamstow, 780(8 lines).
Attwater & Sons	Hopwood Street Mill, Preston	Attwaters, Preston	Preston, 1045 (2 lines).
Austin Motor Co., Ltd.	Longbridge Works, Northfield, Birmingham	Speedily, Northfield	King's Norton, 230-234.
Auto-Ticket Printing Co., Ltd.	11, Wapping, Liverpool	Extension, Liverpool	Bank, Liverpool, 4646.
Avon India Rubber Co., Ltd.	Melksham, Wilts	Rubber, Melksham	Melksham, 2.
Babcock & Wilcox, Ltd.	30, Farringdon Street, London, E.C.4	Babcock, London	City 6470 (8 lines).
Baker & Co. (Rotherham), Ltd., J.	Brinsworth Works, Rotherham	Brinsworth, Rotherham	Rotherham, 89 and 435.
Beckett, Laycock & Watkinson, Ltd.	Willesden, London, N.W.10	Beclawat, London	Willesden, 1558.
Bell Punch & Printing Co., Ltd.	52-58, Tabernacle Street, London, E.C.2	Belpunch, Finsquare, London	Central, 7531.
Bennis & Co., Ltd.	Little Hulton, Bolton	Bennis, Little Hulton	Farnworth, 13.
Bridgeport Brass Co.	Bridgeport, Conn., U.S.A.	—	
Brill Co., J. G.	110, Cannon Street, London, E.C.4	Axles, London	Bank, 6018.
Brimsdown Lead Co., Ltd.	Brimsdown, Middlesex	Hydration, Enfield	Waltham Cross, 132.
Britannia Lamp & Accessories Co., Ltd.	Britannia House, 48, Milton St., E.C.2	Aetnaco, Barb, London	City 1257 (2 lines).
British Aluminium Co., Ltd.	106, Queen Victoria Street, E.C.4	Cryolite Cent., London	City, 2672.
British Insulated & Helsby Cables, Ltd.	Prescot, Lancs.	Insulator, Prescot	Prescot, 8.
British Reinforced Concrete Engineering Co.	1, Dickinson Street, Manchester	Brenforce, Manchester	City, Manchester, 8430.
British Thomson-Houston Co., Ltd.	Rugby	Asteroidal, Rugby	Rugby 54 (5 lines).
British Westinghouse Electric & Mfg. Co., Ltd.	Westinghouse Bldg., Norfolk St., W.C.2	Multiphase, Estrand, London	Gerrard, 3261 and 2476.
Brockhouse & Co., Ltd.	Victoria Works, Hill Top West Bromwich	Brockhouse, West Bromwich	West Bromwich, 431.
Brown & Sons, Ltd.	Park Works, Lockwood, Huddersfield	Gearing, Huddersfield	Huddersfield, 1080.
Callender's Cable and Construction Co. Ltd.	Hamilton Ho. Victoria Embankment, E.C.4	Callender, Fleet, London	Holborn, 1910.
Chamberlins, Ltd.	Botolph Street, Norwich	Chamberlins, Norwich	Norwich, 1042.
Chloride Electrical Storage Co., Ltd.	Clifton Junction, nr. Manchester	Chloridic, Pendlebury	Central, Manchester, 1638
Clayton & Co. (Huddersfield), Ltd.	Karrier Works, Huddersfield	Karriakar, Huddersfield	Huddersfield, 1441, 2, 3.
Coan, R. W.	219, Goswell Road, London, E.C.1	Krankases, Isling, London	Central, 4879; City 3846
Cole & Sons, Ltd., Wm.	235, Hammersmith Road, London, W.6	Imoti, London	Hammersmith, 1414. 1415
Commercial Cars, Ltd.	Biscot Road, Luton	Komerkars, Luton	Luton, 192 and 193.

(*Continued on page iv.*)

THE AUTOBUS

IN THE TRAMWAY WORLD.

Motor Traffic Section.

When "The Tramway and Railway World" was founded in 1892, motor traction was, of course, scarcely dreamt of, but the avowed object of the paper was to encourage all new methods that gave promise of usefulness.

In pursuance of that policy the progress of motor traction received early attention. Commenting on the historic motor parade to Brighton in 1896, "The Tramway and Railway World" predicted that

"It would give a prodigious impulse to transport both by road and rail."

Within a decade this prophecy was abundantly fulfilled and so much space had been devoted to the new industry that in 1906 a special

MOTOR TRAFFIC SECTION

was added. Every illustrated issue thus contains a section devoted especially to motor cars for Public Service, and includes articles on current topics, illustrated descriptions of new types of vehicles and accessories, and the latest news.

Public Service Motor Cars.

The importance of this section will be gathered from the fact that an increasing number of the leading municipal authorities, railway and transport companies now own and operate large fleets of motor vehicles, including omnibuses, chars-a-bancs, motor lorries, for the transport of goods, parcel delivery vans, tower wagons, motor street sweepers, and a variety of other types.

TRAMWAY SUPPLIES, Ltd.

Tramway Engineers,

OVERHEAD LINE MATERIALS AND SUPPLIES.

Sole Manufacturers of

TURNER'S PATENT AUTOMATIC POINT CONTROLLERS.

Telegrams: "Controllers, Leeds." Telephone 26883 Leeds.

160, WOODHOUSE LANE, LEEDS.

OF EVERY DESCRIPTION

SAND OR DIE – 2 h.p. to 600 h.p.

ROBERT W. COAN,

Telegrams: KRANKASES, ISLING, LONDON.

219, GOSWELL RD., LONDON, E.C.

Telephones: 3846 CITY. 4879 CENTRAL

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(Continued from page iii.)

Telegraphic Addresses and Telephone Numbers

Advertisers whose Announcements appear in the Illustrated Issues of "The Tramway and Railway World."

NAME OF COMPANY OR FIRM.	ADDRESS	TELEGRAPHIC ADDRESS.	TELEPHONE No.
Courtenay, J. W., Ltd.	Amberley House, Norfolk Street, W.C.2	Tramigro, London	City, 7630.
Cros, Ltd., W. & G. du	Acton, London, W.3.	Voiturante, Phone, London	Chiswick, 800.
Daimler Co., Ltd.	Daimler Works, Coventry	Daimler, Coventry	Coventry, 505
Dennin Bros. (1913), Ltd.	Onslow Works, Guildford	Dennis, Guildford	Guildford, 575 (4 lines).
Dick & Co., Ltd., W. B.	90, Fenchurch Street, London, E.C.3	Dicotto, London	Avenue, 7854.
Dick, Kerr & Co., Ltd.	Queen's House, Kingsway, London, W.C.2	Dicker, Cannon, London	Holborn, 830.
Docker Brothers, Ltd.	170, Bishopsgate, London, E.C.2	Matured, London	London Wall, 775 [935
Dodson Ltd., Christopher	Cobbold Road, Willesden, London, N W.	Creedolim, Sowest, London	Willesden 1630 (3 lines)
Dunlop Rubber Co., Ltd.	Manor Mills, Aston, Birmingham	Elastic, Birmingham	Birmingham, East 123.
Edison Swan Electric Co., Ltd.	Ponders End, Middlesex	Ediswan, Enfield	Enfield, 520.
Electro-Mechanical Brake Co., Ltd.	Eagle Works, West Bromwich	Brakes, West Bromwich	West Bromwich 291
English Electric Co. Ltd.	Queen's House, Kingsway, London, W.C. 2	—	Holborn, 830
Equipment & Engineering Co.	Westinghouse Bldg., Norfolk St., London. W.C.2	Kharparts, Estrand, London	City, 1088 (2 lines).
Fleming, Birkby & Goodall, Ltd.	Liversedge, Yorks	Woodfield, Liversedge	Cleckheaton, 103.
Fodens, Ltd.	Sandbach, Cheshire	Foden, Sandbach	Sandbach, 7.
Gabriel & Co.	4 and 5, A. B. Row, Birmingham	Gabriel, Birmingham	Birm'ham, Central, 1223.
General Electric Co., Ltd.	67, Queen Victoria Street, London, E.C.4	Polyphase, London	London Wall, 3600
General Seating Co., Ltd.	13, City Road, London, E.C.1	Cushioning, Finsquare, Lond.	London Wall, 6187
Glasgow Numerical Printing Co.	31, Finnieston Street, Glasgow	Tickets, Glasgow	Glasgow, 5350.
Glenn, J. Barber	Moorgate Station Chambers, London, E.C.2	Octet, Ave., London	London Wall, 262
Green & Sons, Ltd., E.	2, Exchange Street, Manchester	Economiser, Manchester	Manchester, 1375
Green & Co. (Feltham), Ltd., Geo. W.	Q-Fel Works, Feltham	Cufel, Feltham	Feltham, 14.
Grover & Co., Ltd.	Carpenters' Road, Stratford, London, E.15	Adopted, Strat., London	Stratford, 984 and 985.
Hadfields, Ltd.	Hecla Works, Sheffield	Hadfield, Sheffield	Sheffield, 750, 2628, & 2634
Halley's Industrial Motors, Ltd.	Yoker, Glasgow	Horseless, Glasgow	Clydebank, 196 and 197.
Henley's Telegraph Works, Ltd.	13 and 14, Blomfield Street, London Wall, E.C.2	Henletel, Ave., London	London Wall, 4560.
Henley's Tyre & Rubber Co., Ltd.	18, New Union Street, Moorfields, E.C.2	Hetewocol, Ave., London	London Wall, 3886.
Herbert Frood Co., Ltd.	Sovereign Mills, Chapel-en-le-Frith	Friction, Chapel-en-le-Frith	Chapel-en-le-Frith, 19
Hoyt Metal Co. of Great Britain, Ltd.	Deodar Road, Putney, London, S.W.15.	Profanity Phone, London	Putney, 1323 and 1324.
Hughes, Bolckow & Co., Ltd.	Battleship Wharf, Blyth	—	—
Hurst, Nelson & Co., Ltd.	Motherwell, Scotland	Nelson, Motherwell	Motherwell, 44.
Johnson & Phillips, Ltd.	Charlton, London, S.E 7.	Juno, Charlton, London, S E.	Greenwich, 400.
Kalker & Co., E.	23, Much Park Street, Coventry	Kalker, Coventry	Coventry, 24X.
Kearsley & Co., Ltd., Robt.	Ripon, Yorks	Kearsley, Ripon	Ripon, 5.
Leare Motor Car Co., Ltd	78, York Road, King's Cross, London, N.1	Unbaffled, London	North, 2708.
Leyland Motors, Ltd.	Leyland, Lancs	Leymotors, Leyland	Leyland, 37.
Lorain Steel Co.	36-38, New Broad Street, London, E.C.2	Thoughtful, London	London Wall, 8180.
Macintosh & Co., Ltd., Chas.	Cambridge Street, Manchester	Macintosh, Manchester	Manchester, Central, 7147.
Macintosh Cable Co., Ltd.	Ashbourne Road Mills, Derby	Macintosh, Eerby	Derby, 1200.
Magnolia Anti-Friction Metal Co., Ltd.	49, Queen Victoria Street, London, E.C.4	Magnolier, Cannon, London	City, 6596.
Maudslay Motor Co., Ltd.	Parkside, Coventry	Maudslay, Coventry	Coventry, 110.
Midland Rubber Co., Ltd.	Ryland Street, Birmingham	Mirco, Birmingham	Midland, 453.
Mirrlees Watson Co., Ltd.	Scotland Street, Glasgow	Mirrlees, Glasgow	South Side, 1781.
Motor Traction	20, Tudor Street, London, E.C.4	Autocars, Fleet, London	City, 2848
Municipal Tramways Association	32, Blackfriars Street, Salford	Tramways, Salford	Central, 5367
Napier & Son, Ltd., D.	14, New Burlington Street, London, W.1	Nitrifier, Reg., London	Gerrard, 8926,
North British Rubber Co., Ltd.	Castle Mills, Edinburgh	Weba, Edinburgh	Edinburgh, Central, 3880
Pease & Partners, Ltd.	Tees Ironworks, Middlesbrough	Pease, Middlesbrough	Middlesbrough, 917.
Pinchin, Johnson & Co., Ltd.	Minerva House, 26-27, Bevis Marks, London, E.C.3	Pinchin, Ald., London	Avenue, 910.
Rail Welding Co.	119, Victoria Street, London, S.W. 1.	Weltrajont, Sowest, London	Victoria, 1363.
Railless, Ltd.	56, Moorgate Street, London, E.C2.	Skrailless, Phone, London	London Wall, 9080
Scholey & Co., Ltd.	56, Victoria Street, London, S.W.1	Scolanco, Sowest, London	Victoria, 6663 (2 lines).
Shrewsbury & Challiner Tyre Co., Ltd.	Kay Street, Ardwick Green, Manchester	Challiner, Manchester [dale	Manchester, Central, 9628
Skefko Ball Bearing Co., Ltd.	Skefko Works, Luton	Skefko, Luton	Luton, 418.
Smith & Co., Frederick	Anaconda Works, Salford, Manchester	Anaconda, Manchester	Manchester, 2334.
Smith & Sons (M. A.), Ltd.	179-185 Great Portland Street, London, W.1	Speedomile, Telew, London	Mayfair 6250.
Smith Bros. & Hill, Ltd.	Albion Tramway Spring Works, West Bromwich	Springs, Westbromwich	West Bromwich, 125.
Spencer, Moulton & Co., Ltd., George	42, Wigmore Street, London, W.1	c/o Wudmiln, London	Mayfair, 6789
Springvale Engineering Works	Blythe Road, West Kensington, London, W.14.	Esveelle, Phone, London	Hammersmith, 1166
Standard Underground Cable Co.	Dock House, Billiter Street, London, E C.3	Gramercy, London	Avenue, 5463.
Stevens Petrol-Electric Vehicles, Ltd.	82, Victoria Street, London, S.W.1	Stemobile, Sowest, London	Victoria 5086.
Stewarts & Lloyds, Ltd.	41, Oswald Street, Glasgow	Lapweld, Glasgow	Glasgow, City, 9880.
Straker-Squire, Ltd.	Nelson Square, Blackfriars, London, S.E.1	Rhomboidal, London	Hop, 369 and 370.
"The Coventry" Chain Co., Ltd.	Spon End Works, Coventry	Chains, Coventry	Coventry, 830.
Terry & Sons, Ltd., Herbert	Redditch	Springs, Redditch	Redditch, 61.
Thermit, Ltd.	675, Commercial Road London, E.14.	Fulmen, Phone London	East, 4157.
Thornycroft & Co., Ltd.	10, Grosvenor Place, London, S.W.1	Thornycroft, London	Victoria, 8000.
Tilling-Stevens, Ltd.	Victoria Works, Maidstone	Tilling-Stevens, Maidstone	Maidstone, 117.
Titan Trackwork Co., Ltd.	Rutland Road, Sheffield	Crossings, Sheffield	Sheffield, Central, 798.
Tramways and Light Railways Association	Sanctuary Chambers, Tothill St., London, S.W.1	Tralitrayl, Vic., London	Victoria, 2110.
Tramway and Railway World	Amberley House, Norfolk Street, W.C.2	Tramigro, London	Gerrard, 2948.
Tramway Supplies, Ltd.	160, Woodhouse Lane, Leeds	Controller, Leeds	Leeds, 26883
Triplex Safety Glass Co., Ltd.	1, Albemarle Street, London, W.1	—	Regent, 1340.
Tyne Metal Co., Ltd.	Hexham-on-Tyne	Floating, Hexham	Hexham, 189.
Underground Electric Railways Co.	Electric Railway House, London, S W.1	Underneath, Vic. London	Victoria, 6800.
United Electric Car Co., Ltd.	Preston, Lancs	Prescar, Preston	Preston, 219 and 220.
Vandervell & Co., Ltd., C. A.	Acton, London, E.C.4	Vanteria, London	Chiswick, 2000 (8 lines).
Waygood-Otis, Ltd.	Falmouth Road, London, S.E.1	Waygood, Sedist, London	Hop, 4000.
Western Electric Co., Ltd.	North Woolwich, E.	Westophone Phone, London	East, 3840.
White Motors & Accessories, Ltd.	Concanon Road, Brixton, London, S.W 2	Genisean, London	Brixton, 565 and 566.
Williamson, Alfred	North Mill Printing Works, Ashton-under-Lyne	—	Ashton-under-Lyne, 320.
Wiseman, Ltd., Alfred	Glover Street, Birmingham	Verus, Birmingham	Victoria, B'ham, 560 & 561
Wood-Milne, Ltd.	21, Albion Street, Gaythorn, Manchester,	Wudmiln, Manchester	Manchester City, 8774.
Woods-Gilbert Rail Remodelling Co., Ltd.	170, Strand, London, W.C 2	—	City, 5147.
Yates, John & Co. Ltd.	Aston Manor, Birmingham	Yatonian, Birmingham.	Birmingham East, 400-402
Zenith Carburetter Co., Ltd.	40-42, Newman Street, London, W.1	Zenicarbur, Ox, London,	Regent, 4812 and 4813.

Printed for the Proprietors by Hamptons Ltd., London, and Published at Amberley House, Norfolk Street, London, W.C.2.—July 5, 1919.
The Offices of THE TRAMWAY AND RAILWAY WORLD are at Amberley House, Norfolk Street, London, W.C.2.

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LONDON, W.C.2.
Telegrams: "TRAMIGRO, ESTRAND, LONDON."
Telephone No. GERRARD 2948.

The Tramway and Railway WORLD

ILLUSTRATED

A REVIEW OF PROGRESS IN Electric AND OTHER Traction.

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TUBES AND FITTINGS FOR ELECTRIC WIRING. STEEL PLATES FOR BOILERS, BRIDGES, Etc. STEEL CASTINGS.

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NOTICES.

All Communications and Advertisements for next week's issue should be received not later than noon on Friday.

Advertisements for the next issue, of which proof is desired should reach us by the second post on Wednesday.

The Editorial and Publishing Offices of "The Tramway and Railway World" are at Amberley House, Norfolk Street, London, W.C.2.

Telegrams: "TRAMIGRO, ESTRAND, LONDON."
Telephone: GERRARD 2948.

TENDERS INVITED.

CITY AND ROYAL BURGH OF DUNDEE.

Electricity Department.

The Corporation invites Tenders for the Supply, Delivery, and Erection of three 750-kilowatt and one 300-kilowatt sets of Rotary Converting Machinery, and for the Supply and Delivery of one 12-panel, 11,000-volts E.H.T. Switchboard and three D.C. Machine Control Panels.

Section
"A."—Three 750-kw. Converting Sets, and one 300-kw. Converting Set.
"B."—11,000-volts E.H.T. Switchboard to control six Feeders and three Converters.
"C."—Two 750-kilowatt D.C. Machine Control Panels. One 300-kilowatt D.C. Machine Control Panel.

Specification and Drawings may be seen at the office of the undersigned, and copies may be obtained on payment of a deposit of one guinea, which will be returned on receipt of a bona-fide tender.

Tenders (sealed in envelopes provided) to be lodged with W. H. Blyth Martin, Esq., Town Clerk, City Chambers, Dundee, *not later than by 10 a.m. on January 23, 1920.*

The Town Council do not bind themselves to accept the lowest or any tender.

H. RICHARDSON, M.Inst.E.E.,
General Manager and Engineer.

Electricity Department, Dundee.
15th December, 1919.

CORPORATION OF BRADFORD.

The Corporation of Bradford invite Tenders for the supply and delivery of Two Electric Battery Locomotives, 60 c.m. gauge, with a haulage capacity of about 10 tons on the level, delivered at their Apperley Viaduct Sidings, Apperley Bridge (Midland).

Further particulars may be obtained from Mr. Joseph Garfield, M.I.C.E., Esholt Hall, Shipley.

The Contract will be let subject to the Fair Contracts Clauses of the Corporation.

Tenders endorsed "Battery Locomotives" are to be delivered at the office of the undersigned not later than 9 a.m. on Wednesday, January 28, 1920.

The Corporation do not bind themselves to accept the lowest or any Tender.

N. L. FLEMING,
Acting Town Clerk.

Town Hall, Bradford,
December 20, 1919.

CITY OF MANCHESTER.

The Electricity Committee of the Manchester Corporation are prepared to receive Tenders for the supply and delivery of the following:—

Specification No. 23.—One 2-ton Electric Lorry.
Specification No. 24.—One 10-15 cwt. Electric Van.

Specifications and forms of tender may be had on application to Mr. F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester, on payment of a fee of £1 1s., which amount will be refunded on receipt of bona fide tenders.

Further particulars and information can be obtained on application to Mr. S. L. Pearce, Chief Engineer and Manager, Dickinson Street, Manchester.

Tenders, duly endorsed and addressed to the Chairman of the Electricity Committee, must be delivered at the Town Hall not later than 10 a.m. on Wednesday, January 14, 1920.

The firms entrusted with these works will be required to enter into contracts to be prepared by the undersigned.

The Corporation do not bind themselves to accept the lowest or any tenders.

THOMAS HUDSON,
Town Clerk.

Town Hall, Manchester,
December 19, 1919.

TEDDINGTON URBAN DISTRICT COUNCIL.

Steam Tipping Wagon.

The above-named Council invite Tenders for a 5-ton Steam Tipping Wagon.

Specification and other particulars may be obtained of MR. MARSHALL HAINSWORTH, Surveyor, Elmfield House, Teddington.

Tenders must be received by the undersigned on or before Monday, 5th January next.

By order,
G. H. SALMONS,
Clerk to the Council.

Elmfield House, Teddington.
December 10th, 1919.

BURNLEY CORPORATION TRAMWAYS.

FOR SALE, about 250 tons 7 in. Section (Barrow, 1901) Scrap Rails.—Apply to the GENERAL MANAGER, Queensgate Depot, Burnley, for copy of specification and conditions of sale.

Tenders are required to be deposited at the Burnley Town Hall not later than December 31, 1919, and must be endorsed "Tender, for Scrap Rails."

Tramway Track Construction and Maintenance.

By R. B. HOLT.

Late Highways and Permanent Way Engineer, City of Leeds.

CONTENTS.

Concrete Foundations and Materials; Repairs to Concrete Foundations; Track Design; Rail Packing and Laying; Joints, Fishplates, Bolts and Nuts; Joint Welding; Rail Wear; Composition and Manufacture of Tramway Rails and Rail Wear; Corrosion of Tramway Rails; Track Paving; Reconstruction; Surface Drainage and Rail Maintenance; Special Track Work.

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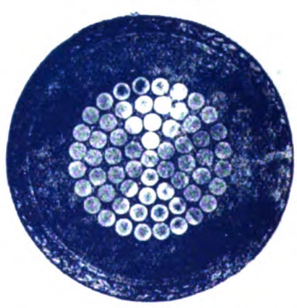
1837.  1918.

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Telegraphic Addresses and Telephone Numbers

Of Advertisers whose Announcements appear in the Illustrated Issues of "The Tramway and Railway World."

Name of Company or Firm	Address.	Telegraphic Address.	Telephone No.
Aerograph Co., Ltd.	43, Holborn Viaduct, London, E.C.1	Aerography, London	Holborn, 2041.
Albion Motor Car Co., Ltd.	Scotstoun, Glasgow	Automobile, Glasgow	Scotstoun, West'n, 1981, 3650
Allen & Co., Ltd., Edgar	Imperial Steel Works, Tinsley, Sheffield	Allen, Sheffield	Sheffield, 917, 265
Allen & Co., Ltd., Edgar (Tramway Dept.)	Imperial Steel Works, Tinsley, Sheffield	Askham, Sheffield, (Tramway and Machinery)	Sheffield, 213
Allen & Simmonds, Ltd.	Reading, Berks.	Pistons, Reading	Reading, 565.
Alloy Welding Processes, Ltd.	14-16, Cockspur Street, London, S.W.1	—	Gerrard, 6165.
Anger Manufacturing & Supply Co., Ltd.	Bank Chambers, Preston	Brakjuster, Preston	Preston, 1033
Armstrong, Stevens & Son, Ltd.	Whittall Street, Birmingham	Armstrongs, Birmingham	Birmingham, 6148.
Associated Equipment Co.	Blackhorse Lane, Walthamstow E. 17	Vangastow, Waltstreet, London	Walthamstow, 780 (8 lines)
Attwater & Sons	Hopwood Street Mill, Preston	Attwaters, Preston	Preston, 1045 (2 lines).
Austin Motor Co., Ltd.	Longbridge Works, Northfield, Birmingham	Speedily, Northfield	King's Norton 230-23
Auto-Ticket Printing Co., Ltd.	41, Wapping, Liverpool	Extension, Liverpool	Bank, Liverpool, 4642
Avon India Rubber Co., Ltd.	Melksham, Wilts	Rubber, Melksham	Melksham 2.
Baker & Co. (Rotherham), Ltd., J.	Brinsworth Works, Rotherham	Brinsworth, Rotherham	Rotherham, 89 and 435.
Bayliss, Jones & Bayliss, Ltd.	Victoria Wks., Monmore Green, W'lverh'mpton	Bayliss, Wolverhampton	Wolverhampton 1041.
Beckett, Laycock & Watkinson, Ltd.	Willesden London, N.W.10	Beclawat, London	Willesden 1558
Bell Punch & Printing Co., Ltd.	52-58, Tabernacle Street, London, E.C.2	Belpunch, Finsquare, London	Central, 7531
Bennis & Co., Ltd.	Little Hulton, Bolton	Bennis, Little Hulton	Farnworth, 13.
Blackwell & Co., Ltd., R. W.	36, Emperor's Gate, London, S.W.7	Kurkee-Southkens, London	Western 4362, 4363, 4364.
Blick Time Recording Devices	174, Grays Inn Road, London, W.C.1	Icktimrek, Holb, London	
Brecknell, Munro & Rogers, Ltd.	Thrissell Street, Bristol	Brecknell, Bristol	Bristol, 3137.
Bridgeport Brass Co.	Bridgeport, Conn., U.S.A.	—	
Brill Co., J. G.	110, Cannon Street, London, E.C.4	Axles, London	Bank, 6018
Brimsdown Lead Co., Ltd.	Brimsdown, Middlesex	Hydration, Enfield	Waltham Cross, 132
Britannia Lamp & Accessories Co., Ltd.	Britannia House, 48, Milton St., E.C.2	Aetnaco, Barb, London	City 1257 (2 lines).
British Aluminium Co., Ltd.	109, Queen Victoria Street, E.C.4	Cryolite Cent., London	City, 2676.
British Insulated & Helsby Cables, Ltd.	Prescot, Lancs.	Insulator, Prescot	Prescot, 71.
British Reinforced Concrete Engineering Co.	1, Dickinson Street, Manchester	Brenforce, Manchester	City, Manchester, 8430.
British Thomson-Houston Co., Ltd.	Rugby	Asteroidal, Rugby	Rugby 54 (6 lines)
British Westinghouse Electric & Mfg. Co., Ltd.	Westinghouse Bldg., Norfolk St., W.C.2	Multiphase, Estrand, London	Gerrard, 3261 and 2476.
Brockhouse & Co., Ltd.	Victoria Works, Hill Top, West Bromwich	Brockhouse, West Bromwich	West Bromwich, 431
Brown & Sons, Ltd.	Park Works, Lockwood, Huddersfield	Gearing, Huddersfield	Huddersfield, 1080.
Burford & Co., Ltd., H. G.,	16, Regent Street, S.W.1.	Burfordism, London,	Regent, 5280 (2 lines)
Callender's Cable and Construction Co. Ltd	Hamilton Ho. Victoria Embankment, E.C.4	Callender, Fleet, London	Holborn, 1910.
Chamberlins, Ltd.	Botolph Street, Norwich	Chamberlins, Norwich	Norwich, 1042.
Chloride Electrical Storage Co., Ltd.	Clifton Junction, nr. Manchester	Chloridic, Pendlebury	Central, Manchester, 1698
Clayton & Co. (Huddersfield), Ltd.	Karrier Works, Huddersfield	Karriakar, Huddersfield	Huddersfield, 1441, 2, 3.
Clough, Smith & Co., Ltd.	36, Victoria Street, London, S.W.1.	Clufmit, Vic., London	Victoria, 7937
Coan, R. W.	219, Coswell Road, London, E.C.1	Krankases, Isling, London	Central, 4879: City 3846
Cole & Sons, Ltd., Wm.	235, Hammersmith Road, London, W.6	Imoti, London	Hammersmith, 1413, 1414

(*Continued on page iv.*)

POSITIONS VACANT.

SHANGHAI MUNICIPAL COUNCIL.

Charge Engineers.

The Shanghai Municipal Council requires the services of three Charge Engineers to take charge of shifts in the Power Station at Riverside, Shanghai. Experience in a similar capacity in a modern generating station of not less than 20,000 kilowatts essential. Also good technical and practical workshop training in electrical as well as mechanical engineering necessary.

Commencing salary 300 taels per month, rising every three years by 30 taels to a maximum of 450 taels per month, with good superannuation allowances. Home leave every five years. Free passages and free medical attendance. The usual rate of exchange for a tael is about 3s.; the present rate of 7s. 4d. is abnormal.

First engagement three years.

Applications, stating age and full particulars of training and experience, together with recent testimonials, to be sent to Messrs. Preece, Cardew, Snell and Rider, 8, Queen Anne's Gate, Westminster, S.W.1, not later than Thursday, January 1, 1920.

TRAFFIC SUPERINTENDENT.

Applications are invited for the above position. Commencing salary £300 per annum. Applicants must have had experience in a similar position, and be capable of negotiating and settling accident claims.—H. HOLLIDAY, Engineer and General Manager, Rhondda Tramways Co., Ltd., Tramways and Electricity Works, Rheola Road, Porth, Glam.

COUNTY BOROUGH OF SOUTHAMPTON.

Traffic Superintendent.

The Tramways Committee tender their thanks to the applicants for the above position, which has now been filled.

JAMES DOBSON,
General Manager and Engineer.

161, Above Bar Street,
Southampton.
December 19, 1919.

TRAMWAY SUPPLIES, Ltd.

Tramway Engineers,

OVERHEAD LINE MATERIALS AND SUPPLIES.

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160, WOODHOUSE LANE, LEEDS.

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ROBERT W. COAN,

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219, COSWELL RD., LONDON, E.C.

Telephones: 3846 CITY. 4879 CENTRAL

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(*Continued from page iii.*)

Telegraphic Addresses and Telephone Numbers

Of Advertisers whose Announcements appear in the Illustrated Issues of "The Tramway and Railway World."

NAME OF COMPANY OR FIRM.	ADDRESS.	TELEGRAPHIC ADDRESS.	TELEPHONE No.
Courtenay, J. W., Ltd.	Amberley House, Norfolk Street, W.C.2	Tramigro, London	City, 7030.
Daimler Co., Ltd.	Daimler Works, Coventry	Daimler, Coventry	Coventry, 505
Dennis Bros. (1913), Ltd.	Onslow Works, Guildford	Dennis, Guildford	Guildford, 575 (4 lines).
Dick & Co., Ltd., W. B.	90, Fenchurch Street, London, E.C.3	Dicotto, Fen, London	Avenue, 7854 (2 lines)
Docker Brothers, Ltd.	170, Bishopsgate, London, E.C.2	Matured, London	London Wall, 2775.
Dodson Ltd., Christopher	Cobbold Road, Willesden, London, N W 10	Creedolim, Willroad, London	Willesden 1630 (3 lines)
Duff Jack Sales Co.	245, Oxford Street, London, W.1.	Ufflijac, Wesdo, London.	Museum, 3694.
Dunlop Rubber Co., Ltd.	Manor Mills, Aston, Birmingham	Elastic, Birmingham	Birmingham, East, 123
Edison Swan Electric Co., Ltd.	Ponders End, Middlesex	Ediswan, Enfield	Enfield, 520.
Electro-Mechanical Brake Co., Ltd.	Eagle Works, West Bromwich	Brakes, West Bromwich	West Bromwich 291
English Electric Co. Ltd.	Queen's House, Kingsway, London, W.C. 2	Enelectico, Westcent, London	Holborn, 830 (10 lines)
Equipment & Engineering Co.	Westinghouse Bldg., Norfolk St., London. W C.2	Kharparts, Estrand, London	City, 1088 (2 lines).
Fleming, Birkby & Goodall, Ltd.	Liversedge, Yorks	Woodfield, Liversedge	Cleckheaton, 103
Fodens, Ltd.	Sandbach, Cheshire	Foden, Sandbach	Sandbach, 45. 46 (2 lines)
General Electric Co., Ltd.	67, Queen Victoria Street, London, E C.4	Electricity, London	London Wall, 3600
General Seating Co., Ltd.	162, Grosvenor Road, London, S.W.1.	Cushioning, Churton, Lond.	Victoria 6290 & 6291.
Glasgow Numerical Printing Co.	31, Finnieston Street, Glasgow	Tickets, Glasgow	Glasgow, 5350.
Glenn, J. Barber	Moorgate Station Chambers, London, E C.2	Octet, Ave., London	London Wall, 262
Green & Sons, Ltd., E.	2, Exchange Street, Manchester	Economiser, Manchester	Manchester, 1375
Green & Co. (Feltham), Ltd., Geo. W.	Q-Fel Works, Feltham	Cufel, Feltham	Feltham, 14.
Grover & Co., Ltd.	Carpenters' Road, Stratford, London, E.15	Adopted, Strat., London	Stratford, 984 and 985.
Hadfields, Ltd.	East Hecla Works, Tinsley Sheffield	Hadfield, Sheffield	Sheffield, 750, 2628 & 2638
Halley's Industrial Motors, Ltd.	Yoker, Glasgow	Horseless, Glasgow	Clydebank, 296 (4 lines)
Hatcham Manufacturing Co., Ltd.	314, Gray's Inn Road, London, W.C.1	Hatcham, North 3847, Lond.	North, 3847.
Henley's Telegraph Works, Ltd.	13 and 14, Blomfield Street, London Wall, E C.2	Henletel, Ave., London	London Wall, 4560.
Henley's Tyre & Rubber Co., Ltd.	18, New Union Street, Moorfields, E.C.2	Hetewocol, Ave., London	London Wall, 3886.
Herbert Frood Co., Ltd.	Sovereign Mills, Chapel-en-le-Frith	Friction, Chapel-en-le-Frith	Chapel-en-le-Frith, 1.
Hora, Ltd., E. & H.	36, Peckham Road, London, S.E.5.	Linchpin, Phone, London	Hop, 3760.
Hoyt Metal Co. of Great Britain, Ltd.	Deodar Road, Putney, London, S.W.15.	Profanity, Phone, London	Putney, 1323 and 1324.
Johnson & Phillips, Ltd.	Charlton, London, S.E 7	Juno, Charlton, London, S.E.	Greenwich, 400
Kalker & Co., E.	23, Much Park Street, Coventry	Kalker, Coventry	Coventry, 24X.
Kearsley & Co., Ltd., Robt.	Ripon, Yorks	Kearsley, Ripon	Ripon, 5.
Leyland Motors, Ltd.	Leyland, Lancs	Leymotors, Leyland	Leyland 37.
Lorain Steel Co.	36-38, New Broad Street, London, E.C.2	Thoughtful, London	London Wall 8180
Macintosh & Co., Ltd., Chas.	Cambridge Street, Manchester	Macintosh, Manchester	Manchester, Central 7147
Macintosh Cable Co., Ltd.	Ashbourne Road Mills, Derby	Macintosh, Derby	Derby, 1200.
Magnolia Anti-Friction Metal Co., Ltd.	40, Queen Victoria Street, London, E C 4	Magnolier, Cannon, London	City, 6506.
Maudslay Motor Co., Ltd.	Parkside, Coventry	Maudslay, Coventry	Coventry, 110.
Metropolitan Vickers Electrical Co, Ltd.	Trafford Park, Manchester	Westinghouse, Manchester	Trafford Park, 190 to 197
Midland Rubber Co., Ltd.	Ryland Street, Birmingham	Mirco, Birmingham	Midland, 453.
Mirrlees Watson Co., Ltd.	Scotland Street, Glasgow	Mirrlees, Glasgow	South Side, 1781
Motor Traction	20, Tudor Street, London, E.C.4	Autocars, Fleet, London	City, 2848
Municipal Tramways Association	Gothic House, Accrington	Beckett, Accrington	Accrington, 2217
Napier & Son, Ltd., D.	14, New Burlington Street, London, W 1	Nitrifier Reg, London	Gerrard, 8026.
North British Rubber Co., Ltd.	Castle Mills, Edinburgh	Weba, Edinburgh	Edinburgh, Central, 3886
Pease & Partners, Ltd	Tees Ironworks, Middlesbrough	Pease, Middlesbrough	Middlesbrough, 917.
Peckham Truck & Engineering Co., Ltd.	10, Coleman Street, London, E.C.2.	Truxenpeck, Cannon, London	Wall, 729.
Peters & Co., Ltd., G. D.	Windsor Works, Slough	Peters, Slough	Slough 201, 202, 203.
Pinchin, Johnson & Co., Ltd.	Minerva House, 26-27, Bevis Marks, London, E C 3	Pinchin, Ald, London	Avenue, 910.
Plumpton, Ltd., Herbert	Liverpool Road, Warrington	Herbert Plumpton, W'rrngtn	Warrington, 586.
Quasi-Arc Co., Ltd	3, Laurence Pountney Hill, London, E.C.4	Quazarc, London	City, 3803.
Rail Welding Co.	119, Victoria Street, London, S.W. 1.	Weltrajont, Sowest, London	Victoria, 1363.
Railless, Ltd.	56, Moorgate Street, London, E.C2.	Skrailless, Phone, London	London Wall, 9080
Scholey & Co., Ltd.	56, Victoria Street, London, S.W.1	Scolanco, Sowest, London	Victoria, 6063 (2 lines
Shrewsbury & Challiner Tyre Co., Ltd.	Kay Street, Ardwick Green, Manchester	Challiner, Manchester [dale	Manchester, Central, 962
Smith & Co., Frederick	Anaconda Works, Salford, Manchester	Anaconda, Manchester	Manchester, 2314
Smith & Sons (M. A.), Ltd.	179-185 Great Portland Street, London, W.1	Speedomile, Telew, London	Mayfair 6250
Spencer, Moulton & Co., Ltd., George	42, Wigmore Street, London, W.1	Spenmoul Wesdo, London	Mayfair, 6789 and 6790
Springvale Engineering Works	Blythe Road, West Kensington, London, W.14.	Esveelle, Phone, London	Hammersmith, 1166
Standard Underground Cable Co.	Dock House, Billiter Street, London, E C 3	Gramercy, London	Avenue, 5463.
Stevens Petrol-Electric Vehicles, Ltd.	82, Victoria Street, London, S.W.1	Stemobile, Sowest, London	Victoria 5086.
Stewarts & Lloyds, Ltd.	41, Oswald Street, Glasgow	Lapweld, Glasgow	Glasgow City, 9880
Straker-Squire, Ltd.	Angel Road, Edmonton, London, N.18	Rhomboidal, Tottlane, Lond.	Tottenham, 2393.
"The Coventry" Chain Co., Ltd.	Spon End Works, Coventry	Chains, Coventry	Coventry, 830.
Terry & Sons, Ltd., Herbert	Redditch	Springs, Redditch	Redditch, 61.
Thermit, Ltd.	675, Commercial Road London, E.14.	Fulmen Phone London	East, 4157.
Thornycroft & Co., Ltd.	10, Grosvenor Place, London, S.W.1	Thornycroft London	Victoria, 8000
Tilling-Stevens, Ltd.	Victoria Works, Maidstone	Petelobus, Maidstone	Maidstone, 117.
Titan Trackwork Co., Ltd.	Rutland Road, Sheffield	Crossings, Sheffield	Sheffield, Central, 798
Tok Manufacturing Co., Ltd.	Empire Works, West Ham Lane, London, E.15.	Utokemako, Phone, London	Stratford, 927.
Tramways and Light Railways Association	Sanctuary Chambers, Tothill St., London, S.W 1	Tralitrayl, Vic., London	Victoria, 2110.
Tramway and Railway World	Amberley House, Norfolk Street, W.C.2	Tramigro, London	Gerrard, 2048.
Tramway Supplies, Ltd.	160, Woodhouse Lane, Leeds	Controller, Leeds	Leeds, 26883
Triplex Safety Glass Co., Ltd.	1, Albemarle Street, London, W.1	Shatterlys, Piccy, London	Regent, 1321.
Tyne Metal Co., Ltd.	Hexham-on-Tyne	Floating, Hexham	Hexham, 189
Underground Electric Railways Co.	Electric Railway House, London, S W.1	Underneath Vic., London	Victoria, 6800.
United Electric Car Co., Ltd.	Preston, Lancs	Prescar, Preston	Preston, 219 and 220
Vandervell & Co., Ltd., T. A.	Acton, London, W.3	Vanteria, London	Chiswick, 2000 (8 lines).
Western Electric Co., Ltd.	North Woolwich, E.	Westophone Phone, London	East, 3840.
White Motors & Accessories, Ltd.	Concanon Road, Brixton, London, S.W 2	Genisean, London	Brixton, 565 and 566.
Williamson, Alfred	North Mill Printing Works, Ashton-under-Lyne	—	Ashton-under-Lyne, 320.
Wiseman, Ltd., Alfred	Glover Street, Birmingham	Verus, Birmingham	Victoria, B'ham, 560 & 561
Wood-Milne, Ltd.	42-46, Wigmore Street, London, W.1.	Wudmiln, Wesdo, London	Mayfair, 6610.
Woods-Gilbert Rail Remodelling Co., Ltd.	170, Strand, London, W.C.2	—	City, 5147.
Yates, John & Co. Ltd.	Aston Manor, Birmingham	Yatcnian, Birmingham.	Birmingham East, 400-402
Zenith Carburetter Co., Ltd.	40-42, Newman Street, London, W.1	Zenicarbur, Ox, London,	Regent, 4812 and 4813

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